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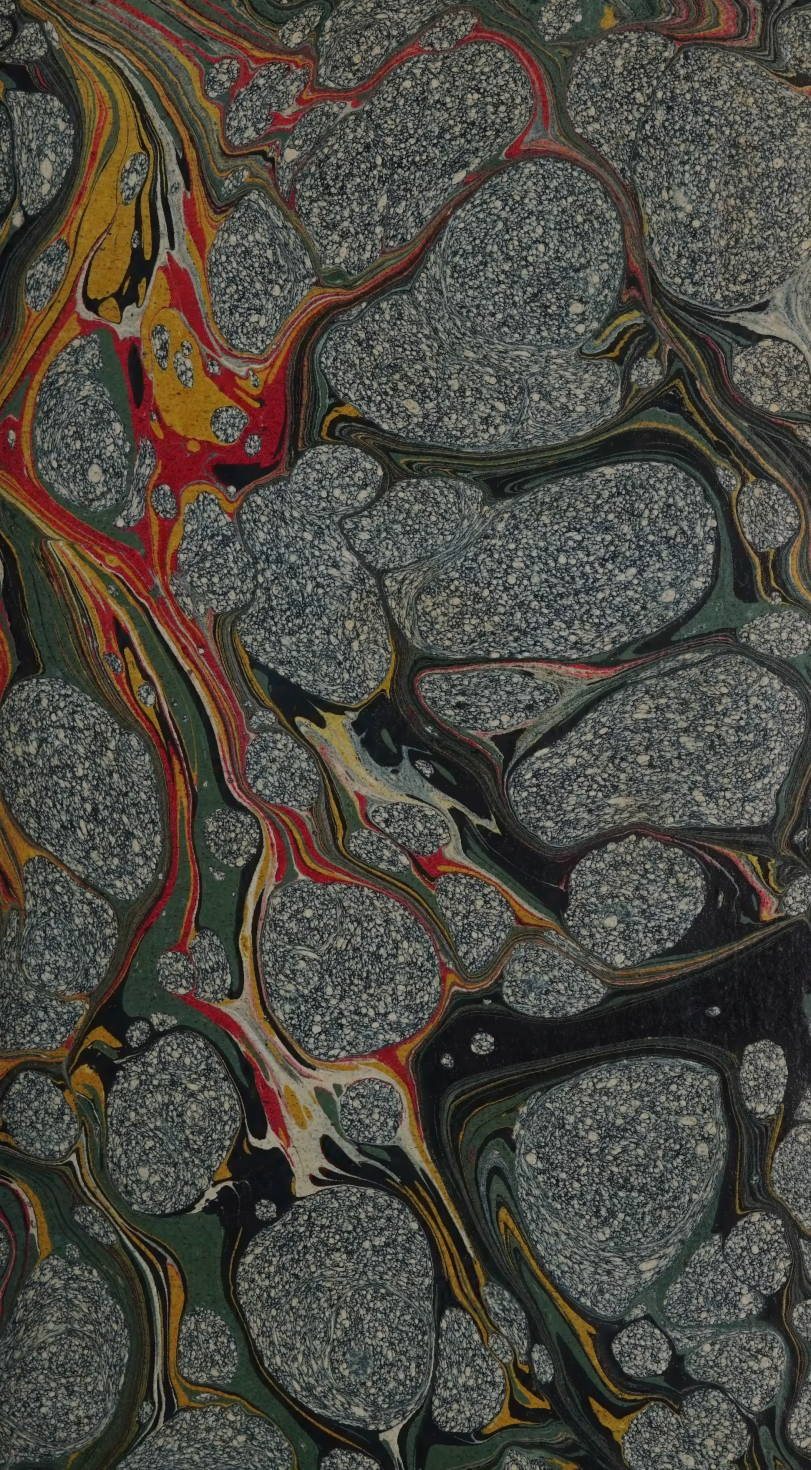

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A TREATISE ON MORTAL DISEASES;

CONTAINING

A PARTICULAR VIEW OF THE DIFFERENT WAYS, IN WHICH THEY LEAD TO DEATH,

AND

THE BEST MEANS OF PREVENTING THEM, BY MEDICAL TREATMENT, FROM PROVING FATAL:

TRANSLATED FROM THE LATIN,

CORRECTED, IMPROVED, AND CONSIDERABLY ENLARGED,

BY THE

AUTHOR,

CONRAD GEORGE ONTYD, M.D.

" Odi profanum vulgus et arceo, quod omnem veteribus in re ſalutari perſpicaciam vel abnegat, ſuamque huic ſubſtituit; vel omnem his ſolis attribuens, quæ nova ſunt prorſus abhorret."

J. P. FRANK, *in Præf. ad Rat. Inſt. clin. Ticinenſis* J. FRANK.

LONDON:

PRINTED FOR J. JOHNSON, No. 72, ST. PAUL'S CHURCH-YARD.

1798.

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ROYAL SOCIETY OF LONDON,

FOR IMPROVING NATURAL KNOWLEDGE.

MY LORDS AND GENTLEMEN,

AS phyſic ranks among the firſt of the arts and ſciences, both with reſpect to the importance of it's object, which is to preſerve the health and lives of mankind, and becauſe it explains many phenomena of nature; a work intended to clear up many intricacies both in pathology and the practice of phyſic, and which beſides ſerves to elucidate ſeveral points in natural hiſtory, cannot be more properly dedicated than to the learned members of the Royal Society; who have as conſtantly patroniſed ſcience in others, as they are univerſally renowned for the cultivation of it in themſelves.

With the hope, my LORDS and GENTLEMEN, that this work may not be found unworthy of your attention, I take the liberty of preſenting it to you, and am, with the utmoſt reſpect and veneration,

MY LORDS AND GENTLEMEN,

Your moſt devoted,

Moſt obedient, and

Moſt humble Servant,

London,
Aug. 24, 1798.

C. G. ONTYD.

PREFACE.

SOME diſeaſes, though rendering the life of thoſe who labour under them very uncomfortable, have not a fatal termination, unleſs indirectly; of courſe do not admit of conſideration here. Theſe diſorders are, however, very few in compariſon of the many diſeaſes, which may end in death. The object of this work is to conſider the nature of the latter; to explain the different ways, in which they may deſtroy life, and to inquire into the moſt powerful means of preventing them from proving fatal.

To deliver a ſyſtem of the doctrines and rules proper for directing the Practice of Phyſic, is juſtly called by the illuſtrious Dr. Cullen an undertaking of great difficulty; and it is with the utmoſt diffidence, that I undertake ſuch an arduous taſk, as to explain the different ways, in which mortal diſeaſes lead to death, and the means beſt calculated to counteract their noxious operation. The extreme difficulty, that neceſſarily attends a reſearch of this kind, will appear ſtriking to any one, who conſiders even for a ſingle moment the

great obſcurity, in which the nature of many diſeaſes is involved, and how little acquainted we hitherto are with their proximate cauſes, and their manner of acting on the human body.—Indeed nothing but the great utility, that muſt reſult from a work of this kind, though it ſhould be a very imperfect one in itſelf, both with reſpect to Pathology and the Practice of Phyſic, would have induced me to make the attempt.

As a particular inquiry into the cauſes, ſymptoms, diagnoſis, and prognoſis of every diſeaſe was requiſite, in order to ſhow, why death is always uſhered in, whatever may be the malady, in a determinate form; why it may be accompanied with nearly the ſame ſymptoms in different diſeaſes; and, *vice verſa*, why the manner of dying may vary in the ſame diſorder: it appeared to me, that, to prove the conſiſtency of the manner of dying with the nature of every diſeaſe, and to point out the moſt powerful means of preventing their fatal termination, the following plan was beſt calculated.

After collecting a ſtock of facts relative either to the diſeaſes of the human body, or to the morbid appearances after death in different diſeaſes, as fully as the compaſs of this work would admit; and being careful not to give any, but what are either

either taken from authors, the abilities and veracity of whom are beyond queſtion, or have fallen under my own obſervation; I have attempted to apply thoſe facts, compared with an attentive obſervation of the ſymptoms attending the different diſeaſes, to the inveſtigation of their proximate cauſes, and their different ways of deſtroying life; and have endeavoured to eſtabliſh upon theſe a more decided and ſucceſsful method of cure. In ſhort, this treatiſe is to be looked upon as an attempt to apply the diſcoveries contained in the valuable works of Bonnet, Morgagni, Soemmering, Baillie, and many other celebrated phyſicians and anatomiſts, with reſpect to the morbid changes the human body undergoes in different diſeaſes, together with an accurate obſervation of the ſymptoms, which take place during life, to the general ſcience of medicine, and eſpecially to it's practice. How far I have been ſucceſsful in this attempt, I ſhall leave my readers to judge.

In aiming at this, I flatter myſelf, that I have avoided all hypotheſes, or what have been improperly called theories. I have indeed attempted to eſtabliſh many general doctrines, as well pathological and therapeutical as phyſiological; chiefly, however, in as far as they ultimately lead to a ſucceſsful practice: but, I truſt, that theſe are only inferences drawn from a cautious generalization of

facts. Laſtly, as this ſyſtem of the theory and practice of mortal diſeaſes is built upon practical obſervations, an accurate attention to the ſymptoms the different diſeaſes exhibit during their whole courſe, and the morbid appearances to be obſerved after death; any one, who ſhall oppoſe it, muſt do it either by ſhowing, that I have been deficient in collecting a ſufficient number of facts, too incautious in adopting, or miſtaken in applying them.

Upon an accurate inquiry into the grounds, on which every chapter of the Practice of Phyſic was founded, I have very often been obliged to differ from the hitherto prevailing doctrines; but, as all the theories, which I have attempted to offer on the nature of the different mortal diſeaſes, originate from practical obſervations; though they may be oppoſed and criticiſed by thoſe, who, having been educated in one ſyſtem or other, are of opinion, that the preſent ſtate of medicine does not require any change, or admit of any amendment; the impartial Public will in general, I truſt, think me juſtified in receding from the eſtabliſhed theories; at leaſt I no where advance a peculiar and new doctrine, without aſſigning the reaſons, which would not allow me to embrace the common opinion, the ſufficiency of which I leave to the conſideration of my readers.

On

On many occaſions I have, indeed, recommended a method of cure partially or wholly different from the common practice. As this recommendation, however, has not been the reſult of theoretical ſpeculations made in the cloſet, but of experience at the ſide of the ſick bed, and an accurate attention to the ſucceſs of the different remedies employed, in patients, who either have fallen under my own obſervation, or under that of other practical phyſicians, the veracity and abilities of whom are beyond diſpute, I willingly ſubmit to the judgment of the impartial practitioner, on giving both methods a fair trial, which of them anſwers beſt the purpoſe, and deſerves to be generally adopted.

In the courſe of this work I have frequently been under the neceſſity of taking a critical notice of doctrines advanced by different medical gentlemen, of whom there are ſeveral ſtill alive. This has been done, I truſt, with all the candour and modeſty the circumſtances of the queſtion could poſſibly admit: but I thought it incumbent on me to point out particularly the imperfections and deficiencies of prevailing doctrines, in order to ſhow the propriety and neceſſity of ſuggeſting new ones; and it ſeemed to me to be the duty of every profeſſional man, to improve the general ſcience of medicine, and eſpecially it's practice, by endeavouring to correct thoſe doctrines, which he deems erroneous.

If,

If, however, any one ſhould be diſpoſed to interpret my conduct otherwiſe, I anſwer with Sydenham: "Non mihi, ſed rationi, aut quæ ratio eſſe videtur, "milito, ſecurus quid mordicus tenet hic aut hic."

I have been careful to avoid all unneceſſary technical terms, and all denominations and diſtinctions of diſeaſes, which communicate either no clear idea of their nature, or an erroneous one: for though in the foundation of every ſyſtem of Phyſic a certain methodical arrangement, if not neceſſary, is at leaſt uſeful, and a diviſion of diſeaſes into claſſes, orders, genera, and ſpecies, may greatly contribute to give both a general notion of the diſeaſes contained in each claſs, and a diſtinct idea of the nature of each diſeaſe; yet, if theſe noſologic diſtinctions be carried beyond a certain point, inſtead of throwing light upon the ſubject, they are apt to cauſe confuſion, they obſcure the ſcience with technical terms, at beſt uſeleſs, and a young man juſt coming from the univerſity, with his head full of theoretical notions and fine noſologic diſtinctions, will, I believe, frequently be embarraſſed at the ſide of the ſick bed, on finding, that theſe theoretical notions do not exactly correſpond with the ſymptoms obſerved in his patients. Indeed I cannot help thinking, that noſologiſts have gone much beyond the point of illuſtration; and that many ſyſtematical diſtinctions originate rather from

theoretical ſpeculation, than from practical obſervation: of courſe, being either ſuperfluous, or not applicable to practice, they may, with great propriety, be expunged from the medical page.

The famous Dr. John Brown ſaw very clearly, that the ſyſtem of phyſic was overloaded with a great number of uſeleſs technical terms, and noſologic diſtinctions; and in founding his ſyſtem took great care to exclude them. But as men are very apt to run from one extreme into another, he fell into the miſtake of ſimplifying too much; his doctrine, well adapted to captivate the imagination of a ſpeculative mind, appears ſimple, complete, and dazzling to the ſtudent, but is by no means ſo well ſuited to inform the judgement, or to clear the doubts of the practitioner; and the impoſſibility in many caſes of applying it's precepts to practice will doubtleſs prevent the cautious obſerver of nature's operations from adopting it.

Many parts of the Brunonian doctrine, however, are ſecure from criticiſm; and whatever changes and revolutions the art of phyſic may undergo in progreſs of time from the introduction of freſh facts and experiments, it's ingenious author will always have the credit of having ſhown the impropriety of the antiphlogiſtic treatment in many caſes, where it has been very warmly recommended even by

Dr.

Dr. Cullen; of having introduced into the practice of phyſic a more liberal uſe of ſtimulants, and a more general exhibition of active remedies, than any one of his predeceſſors; and of having reduced the healing art to general principles, which, though open to many exceptions and modifications, yet upon the whole have been productive of many good effects.

This work was firſt publiſhed in latin, at Leyden, in the year 1797. In the preſent edition I have reviſed the whole, and from more mature reflection, from a great number of practical caſes that have fallen under my obſervation ſince that time, from converſing with different practitioners, and from the obſervations of other phyſicians communicated to me ſince, I have been enabled to correct ſome of my former obſervations, and to make many improvements, and conſiderable additions. In fine, in this edition I expreſs with more confidence ſome of my former remarks, and have omitted others, which I had advanced without ſufficient foundation.

Although I have ventured to offer this work to the public, yet I am very ſenſible of it's imperfections, for notwithſtanding the greateſt care and attention have been employed in collecting a ſufficient ſtock of facts from the beſt ſources, in comparing

comparing them together, and in drawing conclusions from a cautious and full induction, yet several inaccuracies and mistakes will no doubt have escaped me, which, on considering the extent and abundance of the matters to be noticed, they, I hope, will readily excuse, who, having themselves made researches of this kind, are not unacquainted with the difficulties attending them.

Though I have occasionally mentioned the names of those medical gentlemen, who have favoured me with the communication of practical facts, yet I feel a particular pleasure on this occasion in giving a public testimony, how much I am obliged to my worthy preceptors, the professors in the different branches of medicine at the university of Leyden, for the many marks of kindness and friendship they have bestowed upon me, during my attending lectures at that university, and for the kind assistance they have afforded me in collecting materials for this work; which offices the author will always remember with gratitude, and with high esteem for their characters.

I have also much satisfaction in acknowledging here the obligations I am under to Dr. J. G. Schæffer, physician-general to the Hanoverian troops, the military hospital of which was at Leyden in the year 1794, who, agreeably to the urbanity of his manners, and the philanthropy of his

his heart, readily permitted me to viſit the patients, and thus furniſhed me with an opportunity of making many practical obſervations, excluſive of the important advantages I derived from aſſiſting in the numerous diſſections of patients, who died of different complaints, and thus obſerving the morbid appearances after death.

For the ſake of order I have adopted the following methodical arrangement.

I divide the whole work into three parts.

In the firſt I treat of death, it's relation to health and ſickneſs, and it's proximate and remote cauſes in general.

In the ſecond I conſider thoſe diſeaſes, which bring on death by deſtroying the vital principle.

In the third I take notice of the diſorders, which occaſion death, either by ſuppreſſing ſome function requiſite to life, or by deſtroying ſome vital organ.

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* As the exanthematous diſeaſes, in my humble opinion, are only mortal by accident; and as all the danger that accompanies them is to be derived either from the epidemic conſtitution, or from the morbid diatheſis of the body, combined with the exanthematous diſorders, I have not treated of each of them in particular, but of them all in general.

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* Theſe are the inflammations, by which mankind may die, and which, for the ſake of order, I have judged proper to enumerate here, though I have treated of them all together, on account of the great analogy which exiſts among them all.

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A TREATISE

A

TREATISE

ON

MORTAL DISEASES.

Containing a general View of the different Ways, in which they bring on Death, and the beſt Means of preventing this Termination of them by medical Treatment.

PART I.

Of Death, and it's Cauſes in general.

DEATH may be juſtly defined to be the extinction of the vital principle, or of the life of the whole body. The character of life conſiſts in this, that the primary conſtitutive parts of the animal body are prevented by it from entering into thoſe combinations, to which they are incited by the univerſal law of attraction, as well as by the ſpecial law of chemical affinity.—That this depends only on the energy of the vital principle, is wholly proved by the phenomena obſerved a ſhort time after death; for as ſoon as life is deſtroyed, and there remain in the animal body only the powers of thoſe elements of which it is compoſed, theſe, being no more checked in their action by the vital principle, are diſengaged, and cauſe the phenomena, that follow

the laws of chemical affinities, and effect the ſpontaneous deſtruction of the compages formerly organical or vital.

Thus the character of death is oppoſed to that of life, and muſt be derived from it, becauſe it is a negative quality.

Death, therefore, muſt be ſaid to have taken place, not when the actions of the human body have apparently ceaſed; as life may be hidden for ſome time in ſuch a degree, that not only the actions, which are called vital by pre-eminence, ſuch as the pulſe and reſpiration, are ſtopped; but even the leaſt motion cannot be felt; for there are many inſtances of men, who, with every appearance of death, deemed dead by every beholder, nay even buried, have been recalled to life by powerful ſtimuli *.---But the body is to be called dead when the vital principle is totally aboliſhed; or when at the ſame time it has loſt the faculty, which renders it ſuſceptible of being roufed by a powerful *ſtimulus*. Thus the true notion of death conſiſts not in the ſtoppage of the circulation of the blood, or the ceaſing of reſpiration, but in this, that the body will no more act in obedience to *ſtimuli*; or, to ſpeak more clearly, death is the extinction of this peculiar quality, that belongs to living bodies alone, and which gives to the conſtitutive parts of the animal body, when well ſtimulated, the faculty of exciting certain and determinate motions, and of per-

* See J. J. Bruhier *ſur l'Incertitude des Signes de la Mort*, vol. II. Paris, 1749.

forming

forming the functions, to which they are ſubſervient*.

Death conſequently is nothing, but the extinction of the faculty of anſwering a *ſtimulus*, ſo that an action may follow, which does not depend on the univerſal principles of bodies. Whatever occaſions bodies to loſe this faculty ſhould be looked upon as the proximate cauſe of Death †.—But as death is always found to be like itſelf, it is neceſſary, that it's proximate cauſe alſo ſhould be ever the ſame, as it contains in itſelf the complete reaſon of dying: however, to determine in what this proxi-

* Thus the illuſtrious Gaubius, in *Inſtit. pathol.* § 170, improperly calls the vital power of the ſolids that faculty, by which the part contracts itſelf on being ſtimulated. For the vital power, and the contraction of the ſolids, ſhould be well diſtinguiſhed:—the firſt is the faculty of feeling *ſtimuli*, according to certain laws, and of re-acting in conſequence of them: on the contrary, the vital motion itſelf is the effect of that faculty on being ſtimulated: for it is a general law, that the vital power ſhould be incited to act by *ſtimuli*.

† Take notice, that I ſpeak here of univerſal life, or of the life of the whole body; for, when this is nearly extinguiſhed, the particular life of ſome organs, and alſo the faculty of anſwering duly to *ſtimuli*, may for ſome time ſtill remain. If, for inſtance, a man ſhould not die by the abolition of the vital principle, but by the deſtruction of the vital functions, eſpecially if external violence ſhould be the cauſe; in this caſe, where the particular life of ſome organ may ſtill remain, abſolute death will not yet be preſent; but the conſent of the particular life of that organ with the vital principle will be entirely taken away: as I have proved in my Diſſertation on the Cauſe of Abſorption, chapter 1, page 30, by many experiments, that the particular life, eſpecially of the abſorbent veſſels, will ſometimes remain, though the vital principle ſhould be already extinguiſhed.

mate cauſe of death properly conſiſts, would be difficult.—Van Geuns is the firſt phyſician whom I know to have mentioned the proximate cauſe of death; yet even Van Geuns, though he aſſerts, that it does not differ from death itſelf, and is a privative quality, which conſiſts in the ceſſation of life, does not define what the proximate cauſe of death is, or by what means life ceaſes, and that privative quality is produced.—In my humble opinion, the proximate cauſe of death ſhould be looked for in the deſtruction of the vital powers; but that the means, by which this deſtruction is operated, may clearly appear, we muſt conſider life, health, and ſickneſs. The following paragraphs ſerve to this purpoſe.

A living body is one, that has powers and motions not to be explained from univerſal principles.—But what life is, phyſiologiſts do not agree. In general life is conſidered as a principle ſuperadded to organic bodies. Some of the phyſiologiſts place it in the nervous fluid, the exiſtence of which has never been demonſtrated. Others talk of the matter of life diſtributed throughout the whole body. According to the Brunonian ſyſtem, every perſon brings with him into the world his determinate portion of life; which being worn out in conſequence of the waſte of his excitability, he is carried off. Suppoſing this to be the caſe, nature muſt have allowed but a ſmall portion of life to the half of mankind, ſo many dying in infancy. Few phyſiologiſts ſuſpect, that life is to be looked for in the organization itſelf, and is to be conſidered as an effect of it. The very ingenious Dr. Aitkin, however,

ever, is well aware of the fact; for, speaking of life, he expresses himself in the following manner. "As the functions in every instance depend on the mechanism or structure of the organs, (for they are invariably affected by every cause that affects this); it is a necessary consequence, that life is not a principle superadded to organization, but the effect of it; therefore we may safely regard the terms life, vitality, vital principle, living principle, excitability, as synonimous, and expressing a condition of the organs only *." Thus, in the same manner, as a determinate union of nervous fibres forms a nerve, and in it a power named sensibility, which is nothing but an effect of it's peculiar organism, so likewise all deviations from the healthy state are to be looked upon as so many derangements of the organization of the body. The objection, that life cannot be the effect of the organism, because, in many disorders, the structure is not sensibly altered, is of no weight; as the eye, even when aided by glasses, is not always competent to detect slight changes of the structure; it would, therefore, be contrary to sound reasoning, and against the general rule, "as the effects, such are the causes," to maintain, that diseases are not alterations and derangements of the organism of the body, because we are often incapable of detecting changes of the structure in the affected parts.—But if life be the effect of organism, and if almost every part of the body be differently organized, the natural inference must be, that there are so many modifications of life, as there are dif-

* John Aitkin's *Principles of Anatomy and Physiology*, Vol. ii, Page 119.

ferent organiſms of the various parts of the human body. Hence the different ſpecies of the vital powers recorded by phyſiologiſts, as irritability, ſenſibility, contractibility, &c. Each of theſe powers contributes it's part to the ſupport of the animal economy, and from the combination of all theſe reſults the vital principle, or the life of the whole body.—The univerſal life ought, therefore, to be conſidered as a chain of many powers, which, co-operating together, conſtitute a certain harmony, called *health*. For what is health, but a perfect and harmonious concord and equilibrium of the organs of the human body and it's powers? Thus, if this harmony of powers ſuffer only a ſlight diſturbance, in reality a diſeaſe already exiſts; but it is cuſtomary not to call it a diſeaſe, before the harmony of powers is diſturbed ſo much, that the actions proper to the human body can no longer be well and eaſily performed.

To diſturb the equilibrium of the vital powers, or to cauſe illneſs, there is always required,

1. That a morbid ſtimulus ſhould affect the body. —For it is obvious, that nothing can afflict us, unleſs the body be ſome way affected.

2. The re-action of the vital powers. As it is alſo evident, that the vital powers could not be affected without re-acting; ſince it is proved above, that life conſiſts in the faculty the ſolids have of re-acting when operated upon by ſtimuli. — Thus two requiſites always concur to produce ſickneſs; namely, the action of the morbid *ſtimulus*, and

and the re-action of the vital powers; from the concurrence of which ſickneſs itſelf is produced, that is, an effect occaſioned by the action of the noxious power, and the re-action of the organs of the animal body *.

Hence may be explained, why ſome men, though often connected with diſeaſed women, are not puniſhed with the foul diſeaſe; and alſo the reaſon of the phenomena obſerved during the reign of every contagion; as, for inſtance, why from one and the ſame morbid *ſtimulus* ariſe various diſeaſes in different ſubjects: for if the re-action be wanting, the noxious power cannot produce any effect, conſequently no diſtemper will enſue; and by the different re-action of the vital principle the diſorder is differently modified, and aſſumes various forms.

If thus various diſeaſes ariſe from the different reaction of the vital powers; if, beſides, experience ſhow us every day, that children, and irritable perſons, are often very dangerouſly affected by a very ſlight morbid ſtimulus; it will appear, that the nature of ſickneſs muſt vary, in a great degree, from the different re-action of the vital powers; and as ſickneſs itſelf differs in conſequence of their various re-action, it follows, that the nature of ſickneſs muſt depend on the manner in which the vital powers re-act. In fine, it follows alſo, that the eſſence of ſickneſs conſiſts in a ſtruggle of nature,

* On this ſubject the work of Dr. Hufeland *Ideen uber Pathogenie*, Jena, 1796, well deſerves to be conſulted.

defending it's own health againſt the noxious powers *.

As this opinion of the nature of ſickneſs is proved by ſound reaſoning, ſo it is confirmed by an accurate conſideration of the diſeaſes themſelves. For whatever be objected to this definition will be of no weight; ſince no morbid ſtimulus can be deviſed to operate in our body without it's being ſenſible of it.—Now the morbid ſtimulus being perceived, it muſt neceſſarily follow, that the vital powers, incited to act by the preternatural *ſtimulus*, will oppoſe force to force, and, as it were, endeavour to fight againſt the morbid ſtimulus; or, in other words, any noxious power whatever being applied to the human body, the re-action of the vital powers muſt certainly enſue.

But if my opinion of the nature of ſickneſs be founded on the obſervation of nature, what is to be thought of the diſeaſes called paſſive?—The alleged arguments ſeem to prove, that there exiſts no diſtemper, ſtrictly ſpeaking, paſſive; eſpecially, ſince, in diſeaſes named paſſive, evident efforts of the vital powers often take place: and though theſe efforts be obſcurely, or not at all obſerved in ſome diſtempers, it would be as abſurd to conclude, that they do not really exiſt; as to infer, that the arterial veſſels of a chick, during the firſt few days of it's evolution, are abſolutely deſtitute of action, becauſe

* As every one knows, that the difference of diſeaſes depends on the difference of *ſtimuli* alſo, and as diſtempers are here conſidered only with reſpect to the proximate cauſe of death, I ſhall not ſpeak of the difference of the noxious powers.

they

they have no ſyſtole, and exhibit no ſenſible motion, though the circulation of the blood is carried on: or, to make uſe of another example, as if any one ſhould pronounce dead a drowned perſon, in whom he could diſcover neither pulſe, reſpiration, nor the leaſt motion. If we apply to the proximate cauſe of death what I have proved of the nature of ſickneſs, it will be demonſtrated, that it conſiſts in the privation of the vital powers: for we have ſeen above, that ſickneſs is a ſtruggle of the vital powers with the morbid ſtimulus.—If now, in this conflict, the vital powers cannot repel their enemy, but, being vanquiſhed, are forced to ſurrender; the equilibrium among the vital powers not only fails of being reſtored, but, on the contrary, life is taken away, and ſickneſs changes into death; that is, the vital principle being deſtroyed, death immediately exiſts. The reaſon why life is removed ſeems to be, that, by the force of the noxious power, what conſtitutes life is aboliſhed, that is, by it's violence the organiſm of the part is deſtroyed.—For, that the noxious powers operate by deſtroying the organical ſtructure, principally appears from the phenomena, obſerved in a living body after applying a *morbid ſtimulus:* namely, there ſoon enſue unuſual and irregular motions, which ſucceſſively vary: now they are augmented, again leſſened, and at laſt they entirely ſubſide. But as all the phenomena, which any organ affords, depend on it's organiſm, it muſt follow, that all theſe unuſual and irregular motions are only generated by alterations of the organical ſtructure; and thus there are as many alterations of the organiſm of the human body, as there are irregular motions after the applying of the morbid

ſtimulus:

ſtimulus: in fine, it will follow from this principle, that the organical ſtructure of the animal body, having already ſuffered various alterations, becomes at length entirely deſtroyed by the noxious ſtimulus; and every motion, as depending upon the organiſm of the parts, is totally ſtopped. Hence even the moſt dreadful poiſons of the mineral kingdom, though operating with corroſive violence when applied to a living body, have nevertheleſs little, or no effect on a dead body; which evidently ſhows, that they act by deſtroying the organical ſtructure of the parts. It appears therefore, that the proximate cauſe of death conſiſts in the deſtroying of the organical ſtructure, by the deſtruction of which the body is immediately deprived of life, this being owing ſolely to it's organiſm. Indeed, however far the circuit of diſeaſes may extend, there is no diſtemper, in which the equilibrium of the vital powers is not, in a greater or leſs degree, deranged; or is there any manner of dying, in which the vital powers are not taken away: in other words, nobody ever dies but by the deſtruction of the organization of his body. Having treated thus far of death, and it's proximate cauſe, I now paſs on to the conſideration of the remote cauſes of death.

In conſidering the whole human body we are taught, that theſe cauſes are numerous, and very different:—for as the human body is formed of ſo many parts, of which each has it's proper powers, and lives it's peculiar life; and as the life of the whole body is nothing but the ſum of all the vital powers, peculiar to every part of the animal body; various differences of death cannot but appear. For,

if

if the univerſal life, or the life of the whole body, take it's origin from the equilibrium of the life of all the organs, there may be as many remote cauſes of death, as there exiſt cauſes, which deſtroy the equilibrium of the powers, on which health depends. Nevertheleſs the deſtruction of each individual part of the human body, taken ſeparately, is not able to overturn this harmony of powers; as experience ſhows, that many parts of our body may be loſt, without cauſing the deſtruction of the univerſal life.

Accordingly, it is requiſite, for the extinction of the vital powers, either that the vital principle be aboliſhed, as it were, by a ſingle ſhock; or that the attack ſhould be made on thoſe functions, without which life cannot be ſuſtained even in the loweſt degree.

Among theſe injuries of functions from which follow the death of the whole body, are to be enumerated the abolition or the oppreſſion of the circulation of the blood or of the function of reſpiration, the impeding of the action of the ſtomach and bowels, the deſtruction of the energy of the brain and nerves, the oppreſſion or abolition of the action of the veſſels of the lymphatic ſyſtem, &c.

As all theſe parts are conſtantly requiſite to the life of the whole body; no one will doubt, but that the taking away of their functions will prove mortal;—yet I have no where found mentioned a reaſon, at leaſt a ſufficient one, why, without theſe, life cannot ſubſiſt, though it is beyond all doubt, that none of

theſe

these directly take away the proximate cause of life. —The true reason, why the impediment of any of these functions proves mortal, seems to me to be this: that they are so many causes, without which our body cannot be properly stimulated.—This is proved by the following positions:

1. No life can exist without *stimulus*.

2. A *stimulus* is any thing, that can affect our organs.

3. No stimulus can be called universal; but all are only relative, and very different for different subjects, nay for various organs of the same individual.

AS to the first. That life cannot exist without *stimulus*, it is proved both from the state of health, and the state of sickness:—for we see, that the heart cannot exert it's function without the blood, which we know to be it's peculiar stimulus. The same may be asserted of all the other organs of our body. This is also true in the morbid state, for as long as the morbid stimulus is not removed, the cure of the complaint cannot be accomplished, but this being removed, according to the general rule "sublata causa tollitur et ipse effectus," the disorder itself is in general easily remedied. Hence neither in the healthy nor morbid state does any motion exist, or is any function performed, without *stimulus*; and, according to the various stimuli, various effects also arise;—since the re-action, or, as the physiologists term it, the vital power, is in the compound ratio of the stimulus

mulus applied, and the faculty of perceiving it; which faculty depends on the organical ſtructure of the part. Thus it appears, that *ſtimuli* are requiſite to life, both in the healthy and in the morbid ſtate.

As to the ſecond. Stimuli are, in my opinion, all things that have the faculty of affecting the human body; for the celebrated Dr. Brown juſtly obſerves, that all powers that operate on the animal body have more or leſs of a ſtimulant effect, and that this may be either exceſſive, in due proportion, or too ſmall. For inſtance, a vegetable diet, when made uſe of by a gentleman, who has been in the habit of living in a high manner during a long time, will bring on debility, and a prediſpoſition to many diſorders. As however many perſons live only on vegetables, it muſt conſequently ſtill be underſtood to be ſtimulant; only ſo much leſs ſtimulating, as the penury of the diet is more conſiderable. Hence in thoſe who are accuſtomed to a better fare, the ſtimulus of vegetable diet is too ſmall, and not capable of ſupporting health. Though thus all powers operating on the living body are to be called ſtimuli, yet, in order to prevent confuſion, we ſhall in future call thoſe ſtimulant remedies, which act by an exceſſive or conſiderably ſtimulant operation; whereas ſuch as by their weakly ſtimulant power communicate to the human body a degree of ſtimulus greatly inferiour to the proper one we ſhall name ſedatives, antiſpaſmodics, and anodynes. It ought, however, to be remarked, 1, that as the human body undergoes various changes in different diſorders, and the effects are always in the

compound

compound ratio of the ſtimulus applied and the reaction of the vital principle depending on the organization of the body, the ſame remedy, which proves a powerful ſedative in one diſeaſe, in another may afford a very effectual medium of rouſing the vital powers into action; that is, it may act like a ſtimulant remedy, as is the caſe with opium in ſome diſeaſes. 2dly, That their ſedative effect in a great meaſure depends on the greater or ſmaller doſes taken. 3rdly, That even the moſt powerful ſedatives, as opium, cicuta, belladonna, &c., ſtimulate previous to their lowering the ſyſtem; but that their degree of ſtimulating the body is much inferiour to the lowering of the ſyſtem ſucceeding to it.

As to the third. It appears thus, that no *ſtimulus* can be called general; and that the effects, which ſtimuli produce, when applied to bodies, are only to be accounted for by the peculiar organiſm of ſuch bodies. Hence not only in different ſubjects, but alſo in the ſame ſubject, according to the peculiar modification of the organs, ſtimuli operate differently. The ſame degree of cold, being applied to two perſons, will prove for the one a powerful tonic, whereas in the other, it will occaſion a torpor of the vital principle: perſons, who could expoſe themſelves to ſome morbid ſtimuli without being affected, will, in general, loſe that prerogative, when weakened by any cauſe. In the human body the different organs have different ſtimuli accommodated to their ſtructure: ſo, for inſtance, light is a *ſtimulus* only to the eyes; ſound affects but the ears; ipecacuanha, and emetic tartar, which do not diſagreeably affect the tongue, act violently on

the ſtomach; purgatives ſtimulate ſcarcely any part, but the inteſtines; and the foxglove, which leſſens the action of the heart and blood-veſſels, at the ſame time ſtrongly irritates the lymphatic ſyſtem, and properly deſerves to be called a ſtimulus for the abſorbent veſſels. This holds good not only in regard to the exteriour ſtimuli, but, alſo, with reſpect to the interiour ones; as the humours of our body, already partly or totally prepared, conſtitute peculiar ſtimuli for their veſſels. For inſtance, the lymph irritates, that is ſtimulates, the abſorbent veſſels, and the thoracic duct; and the blood ſerves not only for a ſtimulus to the whole ſanguineous ſyſtem, but alſo acts in the ſecretory veſſels: nay, in my humble opinion, it ſeems highly probable, both that every ſecretory organ receives a peculiar ſtimulus from the blood, the conſequence of which is, that a peculiar humour, and very different according to the various organiſm of each excretory organ, will be ſecerned from it; and, that all the functions of the human body ought to be explained from the peculiar perception of the ſtimuli, and the ſpecific reaction of the organs. If I ſum up what I have hitherto proved, applying it to the remote cauſes of Death, I ſhall have proved my theſis. For if life cannot exiſt without ſtimulus; if every thing that operates in the body be a ſtimulus; if all ſtimuli be only relative; if every organ of the human body have it's peculiar ſtimulus; if, in fine, all the humours ſerve as ſtimuli for their veſſels; it follows, that all the above mentioned functions act as ſtimuli with reſpect to the whole body, and that the oppreſſion, or extinction of each of them,

them, though variouſly, and in a different ſpace of time, muſt therefore extinguiſh life.

The cauſes of Death are thus divided into the proximate cauſe, which, ſtrictly ſpeaking, cannot be diſtinguiſhed from death itſelf, and the remote cauſes; which laſt conſtitute the different manners of dying, and to which are owing the various phenomena, obſerved in different caſes during the agony of death. For, according to the different morbid ſtimulus, which attacks the patients; the different function, which is injured by it; and, in fine, the different conſtitution of the body itſelf; a thouſand differences of death ariſe: and thence death ſometimes deſtroys the human frame ſuddenly, at other times by ſlow degrees; in one man by evident and ſtrong efforts; in another ſecretly; ſometimes violently, and at one ſhock; and ſometimes as it were ſpontaneouſly.

It will be very difficult, notwithſtanding, to determine in all caſes what has been the remote cauſe of death, and this will often be impoſſible: as the harmony, which exiſts among the different parts of the human body, is ſuch, that no one function can be eaſily vitiated, without all the others being directly affected by ſympathy: and the more, as this harmony, though very great in the healthy ſtate, becomes much greater during ſickneſs; both becauſe all the parts of the human body are rendered more ſenſible by the morbid affection, and that, though it is perhaps nothing but a conſequence of a greater ſenſibility, in ſickneſs a ſympathy ariſes alſo among ſuch parts as, in the vigour of health, ſeem

to

to have no particular connexion. Such a ſympathy, for inſtance, is obſerved between the kidneys and the ſtomach, the noſe or wind-pipe, and the diaphragm, the feet and the ſtomach in the ſtone, podagra, and hyſterical paſſion, ſo the perſpiration being impeded, the digeſtion is often likewiſe impaired, and the appetite leſſened by the ſtrong ſympathy between the ſkin and the ſtomach. The celebrated Dr. Gregory records, that ſometimes pain with heat of the ſoles of the feet, or horrible pain of the arm during the making of urine, is obſerved from an ulcer in the bladder *. From the ſame ſource may be explained why the ſmell of roſes or muſk often produces the moſt violent convulſions and faintings in thoſe affected with the hyſterical paſſion: in like manner a locked jaw ſometimes proceeds from the ſlighteſt wound; and an inflammation of the cheſt often ariſes by ſympathy from a matter confined in the ſtomach, uſually called vitiated bile.

It appears, therefore, how obſcure the remote cauſes of death may very often be, and how difficult conſequently it is, to reduce them to any general heads, each of which requires due limits, to prevent their being confounded together. Dr. Van Geuns is well aware of this difficulty, and after dividing the remote cauſes of death into combination, mechaniſm, and powers, he adds, that this diviſion, as only made for the ſake of order, ſhould not be ſo ſtrictly taken, as if the one were entirely independent of the others: on the contrary he aſſerts, that

* See *Conſpectus Medicinæ Theoreticæ*, vol. 1, cap. xi, § 363.

they very often concur together *. I ſhall now inquire into the principles of this opinion, to enable me to draw a juſt concluſion whether the remote cauſes of death can be rightly divided, according to the opinion of this phyſician. Dr. Van Geuns having reduced all the remote cauſes of death to three principles, mechaniſm, combination, and powers; this opinion he attempts to prove verbatim in the following manner:—"In the firſt place, the ſolids, "in the ſame manner as the fluids, in as much as "they are objects of chymiſtry and phyſic, that is "as to their juſt combination, and union of princi- "ples, may be ſo altered and corrupted, that for "this ſole reaſon they become uſeleſs to life. Or "the ſolids, in as much as they are objects of ana- "tomy, that is as to their ſtructure, connexion, and "mechaniſm, may be ſo vitiated, and impeded, "that they may become entirely unable to perform "the common functions of the economy, and, there- "fore, bring on death. Or, in the third place, "even the vital power of the parts, without any "remarkable vitiation either of their combination, "or ſtructure, may be ſo affected, as either di- "rectly to be deſtroyed, or to prepare for itſelf, "as it were, deſtruction by violence and irregu- "larity of motion †."

Thus Van Geuns has ſtated in this diviſion,

1. That the combination and union of principles may of themſelves be altered and corrupted; and that ſo a perſon may die from a chymical cauſe alone.

* L. l. § 6, p. 7. † L. l. § 6, p. 6.

2. That

2. That the ſtructure and mechaniſm of the parts may of themſelves be vitiated, and, therefore, from a mere mechanical cauſe death may enſue.

3. That the vital principle may be extinguiſhed, without any alteration of the organical ſtructure.

With great deference to this learned phyſician, in my humble opinion, each of theſe aſſertions may be contradicted. From what I ſaid above of the great ſympathy ſubſiſting throughout the human body, it might have been concluded, that theſe powers cannot be ſeparately conſidered, much leſs an accurate diviſion of them formed: beſides, the doctor makes a diſtinction between the mechaniſm, and the vital powers, which evidently ſhows, that he, alſo, conceived the vital powers to be a principle ſuperadded to the ſolids and fluids: an opinion which, though founded upon mere authority, was univerſally received at the time the doctor's diſſertation appeared. Hence it will follow, that, if this hypotheſis fall to the ground, the diviſion attempted by Dr. Van Geuns muſt accompany it, as being founded upon it. It has already been demonſtrated, that the properties, or phenomena, diſcovered in all organs, are only effects, ſhowing why they are ſuch in the peculiar organiſm of the parts, and in the manner of their union: thus, for inſtance, from the determinate union of the muſcular fibres is produced a muſcle, and in this a determinate power, called irritability, which differs from all the powers inherent in the other parts of the body, in the ſame manner as a muſcle differs from the compoſition of all the other

parts by its peculiar organiſm *. Therefore, what is uſually called by phyſiologiſts the vital power is, ſtrictly ſpeaking, only an effect of the power, that ought to be well diſtinguiſhed from it's cauſe, properly to be called power. But, as the cauſes of all the vital powers are hitherto, and perhaps ever will be concealed, there remains only to inquire accurately into their actions, or effects, and by them, according to the common rule,—as the effects, ſuch are the cauſes,—to determine the cauſes themſelves.

It is thus evident, that mechaniſm and powers, or ſtructure and faculties, in the human body, in ranking the claſſes of the remote cauſe of death, can by no means be ſeparated, but on the contrary they ought always to be joined. As in the death cauſed by old age, and in all the diſeaſes ranked by Dr. Van Geuns in the claſs of mechaniſm, the vital powers ought abſolutely to be attended to; for it is proved, that the vital power depends on the ſtructure of the organs: and nobody doubts, but that the organiſm of the human body is altered by old age; conſequently this alteration muſt alſo alter the vital powers. The ſame is to be ſaid of all the diſeaſes brought into this claſs.

With reſpect to the diſorders of combination, neither the ſolids nor fluids can be conſidered as mere objects of chymiſtry, for the action of chymical ſolution is impeded by the vital principle. It is true, indeed, that in ſome diſeaſes, wherein, by the violence of the morbid power, the vital principle lan-

* See on this ſubject, my diſſertation *De Cauſa Abſorptionis per Vaſa lymphatica*, cap. ii, § 1 et 2.

guiſhes

guiſhes and is deadened, the chymical powers may act more than in the healthy ſtate; whence the propenſity of the blood to diſſolution in putrid diſeaſes; but, on the other hand, it is no leſs true, that this chymical diſſolution never takes place, as long as the leaſt ſpark of life remains.

As thus during life there is no function merely chymical, no chymical laws can of courſe be applied to a living body without the greateſt precaution. It muſt yet be obſerved, that I do not deny the influence of the chymical powers in a living body; on the contrary I willingly allow, that a living body, as well as other bodies, may be chymically affected, as many phenomena, both phyſiological and pathological, ſufficiently prove. Thus by foggy air perſpiration is leſſened, and the body relaxed, as on the contrary, by dry air it becomes parched through the exceſs of perſpiration. The diſengaged caloric greatly varies with reſpect to the human body, in different temperatures of the atmoſphere; and there needs no demonſtration to prove the great influence of electricity on our bodies. However, all theſe chymical actions are modified by the vital principle, and operate in a very different manner, from that in which they act when applied to a dead body, that is, they are ſubjected to the laws of animaliſation.

Therefore all chymical operations in a living body ought to be conſidered as compounded on the one part of the chymical powers, and on the other of what they have acquired from the animaliſation or conjunction with the vital powers: ſuch powers may thus be juſtly called chemico-animal. This is ex-

emplified in the phenomena accompanying reſpiration: phthiſical patients, for inſtance, though they often have a great deal of the lungs corrupted, are provided with a greater degree of animal heat, than healthy and vigorous men; which ſhows, that the attraction of the oxygen gas, and of a greater quantity of latent heat combined with it, is not in proportion to the ſurface of the lungs, which comes in contact with the air of the atmoſphere; but depends chiefly on the manner in which the veſſels of the lungs act. But perhaps the diſorders of combination may be conſidered in another light, namely as the primary diſorders of the fluids. However if we accurately inquire into this ſubject, it will appear, that theſe diſorders ſhould not be conſidered as diſeaſes, but only as effects of diſeaſes. For the corruption of humours called putrid; the gangrene ariſing from the intenſeneſs of cold, inflammation, or burning; cancer, and all other cauſes, which, according to Dr. Van Geuns, bring on death by the above diſorders, by no means prove the doctor's opinion in the leaſt, as the vitiated craſis of the humours in theſe caſes, as well as in all others, ought to be looked for in the previouſly altered manner of acting of the ſolids: ſince, if from a preceding inflammation, from cold, poiſons, or any cauſe whatever, mortification be brought on, it is always produced either by the torpor or extinction of the vital power; for daily experience ſhows, that irritability, ſenſibility, and all other ſpecies of vital powers are very much diminiſhed, and at laſt totally extinguiſhed, if either too powerful or too long continued a ſtimulus be applied to any part. It is at preſent generally allowed, that the ſecretion of purulent matter in the cancer, and that of ichor

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in other ulcers, is the effect of the determinate action of the ſolids.

Neither, therefore, can the diſorders of combination be conſidered in this view: particularly as the economy of the whole animal kingdom confirms, by numerous examples, that the difference of humours, both in the healthy and morbid ſtate, depends only on the different mode of action of the veſſels: thus, for inſtance, the tears ſometimes loſe their ſaline taſte, and become ſweet *. Beſides, how very great are the alterations we obſerve in the ſecerned humours from the paſſions of the mind! Let a nurſe be angry, and give the breaſt to a child, it will ſuck a poiſon inſtead of wholeſome nouriſhment; the bite of a provoked animal, though naturally very mild, will make a man mad, and hydrophobical, if the poiſonous ſaliva be infuſed into the wound. The moſt evident inſtances of this are found in the Tranſactions of the Chirurgical Society of *Amſterdam*, where, among other caſes, is recorded one of a dog, which, being provoked by a boy, bit him in the left foot; from which the boy was ſeized with the hydrophobia, and died after three days; the dog remaining in good health. It is related in the ſame book, that the bite of an angry man may alſo make others mad †. Gaubius mentions a caſe of an italian boy, who, being provoked, and unable to revenge himſelf, bit his finger, and died hydropho-

* Haller *Elementa Phyſiologiæ*, T. v, p. 325.

† *Verhandelingen van het heelkundig Genootſchap te Amſterdam*, Vol. ii, a p. 49 ad p. 56.

bical *; all which inſtances leave no doubt, but that every diſorder of the fluids ſhould be explained from the peculiar change the ſolids have undergone.

Nevertheleſs, I would not have it thought, that I am ſo favouring the doctrine of the ſolids as to maintain, that the humours contribute nothing to pathology: indeed, the defenders of this doctrine, by attempting to avoid one danger, fall into another: on the contrary, I readily agree, that the humours of our body have their peculiar powers, and that both the blood, and other non-excrementitious humours, live their peculiar life; as, doubtleſs, living humours are continually ſecerned from the blood itſelf, and even the blood, in the peripneumony, and other diſeaſes, very often forms new membranes, nay veſſels themſelves; which, among other arguments, the illuſtrious Hunter, Hufeland, and others, make uſe of to prove beyond diſpute, that the blood is not deſtitute of life. But if the humours live their peculiar life, it follows of courſe, that they muſt counteract ſtimuli, and have ſome ſhare in the production of many diſeaſes; though the ideas of the acetous, acerb, alcaline, muriatic, and other acrimonies, which, according to the fancy of many authors, very often taint the whole maſs of our humours, ought juſtly to be rejected: for theſe opinions were not founded on accurate obſervations taken from the ſick, but merely built on the rude theory of the times. Moreover, as the fluids are

* *Sermo Academica altera de Regimine Mentis, quod Medicorum eſt*, p. 13.

never

never primarily, but always ſecondarily affected by the previous alteration of the organiſm of the ſolids, they have, ſtrictly ſpeaking, no diſtempers: and, therefore, in regard to the remote cauſes of death, no account can be taken of them.

This opinion being refuted, it is neceſſary to ſubſtitute another, better founded on the obſervations of nature: but to ſucceed in this, it ſeems to me proper, to give a ſummary of ſome things that I proved above, and which being conſidered in connexion, will make it more eaſy to lay down a proper diviſion of the remote cauſes of death. It is demonſtrated, that the life of the whole body takes it's origin from the organical ſtructure of all the parts. It is no leſs evident, that the proximate cauſe of death is the reverſe of the proximate cauſe of life, and that the ſame may be ſaid of the remote cauſes. It follows then, that there are as many remote cauſes of death, as there are cauſes which deſtroy the organiſm of the body.

The chain of the vital powers, or the organiſm of the body, may therefore be deſtroyed in two ways.

1. By the deſtruction of the univerſal life.

2. By the removal or deſtruction of one or two of the links, without which the connexion of the chain can no longer ſubſiſt.

Thus it is requiſite, to the extinction of the vital powers, or to death, either that the vital principle be extinguiſhed, or that the links in the middle of

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the chain be deſtroyed; for I need ſcarcely mention, that thoſe at the end of the chain may be taken away, and life ſtill remain: ſince numerous inſtances of perſons mutilated not only in the upper and lower extremities, but alſo in the other organs, without dying, put this beyond all doubt; and experience ſhows, that all the parts of the human body at the ſurface may be deſtroyed without extinguiſhing the vital principle.

PART

PART II.

Of Death

FROM

The Destruction of the Vital Principle.

I comprise under the diſeaſes, which bring on death by deſtroying the whole vitality, not only thoſe that either extinguiſh it, as it were, by a ſingle ſhock, or ſuppreſs it by degrees; but, alſo, more extenſively ſpeaking, thoſe which, though not acting in all the parts of the body, exert their power in moſt of them, and thus do not break the chain of the vital powers by taking away one or two of the links; but by deſtroying the principal functions, or impeding their action. Theſe diſeaſes being thus conſidered, this part may be divided into the following ſeven claſſes.

1. Death from old age.
2. ——— —— the paſſions of the mind.
3. ——— either from the abundance or want of caloric.
4. ——— from the electric ſhock.
5. ——— —— different kinds of gas, noxious to the animal economy.
6. ——— —— Poiſons.
7. ——— —— Univerſal diſeaſes.

Although

Although this diviſion will not be found complete in all it's parts, it may be made uſe of in arranging whatever I may have to ſay of the cauſes of death. I have diſpoſed theſe cauſes in claſſes according to their moſt uſual mode of acting; and I ſhall give occaſional notice of their exceptions, as they occur.

CLASS

CLASS I.

DEATH FROM THE MECHANISM OF THE BODY ITSELF.

GENUS I.

Death from Old Age.

I BEGIN with this, which, though it is rarely the caſe, that a man dies without any diſtemper, is nevertheleſs, the moſt natural exit of life, and late or early happens to the human body, even from the vital actions performed according to the laws of health: for our frame ſhares the fate of all others; man wears out by his own mechaniſm, and our body, by mere acting, becomes at laſt unfit for action. The attrition common to dead machines, however, does not exiſt in the living: but, on the contrary, life itſelf deſtroys them in a totally different manner. Moſt phyſiologiſts ſtate three epochs of human life; the firſt, that of the increment or growth of the body; the ſecond, that in which it is ſtationary; the third, that of decay: but, ſtrictly ſpeaking, there are only two, increment and decay; and indeed the ſeeds of decay are preſent from the firſt inſtant of life, ſo that the new born infant gives evident tokens of that death which is to enſue.

In a new born infant, the ſkin is very delicate, and the cellular texture very ſoft; the muſcles are obſerved

obſerved to be tender; the perioſteum is ſoft, and full of veſſels; even the bones, for the moſt part, ſtill retain the cartilaginous ſtate; in a word, the whole little body is, as it were, ſpungy, and furniſhed with numberleſs veſſels; the actions of the heart and the ſanguineous ſyſtem are very vigorous, when compared with the action of other parts; for in our climate, during the firſt days after nativity, in a ſleeping child a hundred and forty pulſations are counted in a minute. After birth, the child continues to grow, and increaſe every day, but it increaſes leſs and leſs, the more it recedes from nativity, and this is not wonderful; as the firm parts, acquiring more tone, and becoming ſtronger, oppoſe more reſiſtance to ſtimuli, and can no longer be ſo eaſily incited to act: for that this acquiſition cannot be made without the diminution of the irritability, is proved by this, that before the end of the firſt year, according to the teſtimony of Dr. Blumenbach, one of the moſt accurate obſervers of nature, in the ſame ſpace of time there are enumerated only a hundred and twenty-four pulſations *. What a remarkable decreaſe of irritability! Such is the fate of mankind! The ſtrength required for walking is not attained by an infant, without the irritability being in ſome degree diminiſhed, on account of the increaſed tone of the ſolids; and this ſtrength itſelf already leads to death, as the latin poet elegantly expreſſes it:

Naſcentes morimur, finiſque ab origine pendet.

The child ſtill continues to grow, yet every ſuc-

* *Inſt. Phyſ.* ſect. ix, p. 77.

ceeding

ceeding year adds leſs and leſs to it's ſize, in proportion as it is remote from the commencement of life: the force of the ſolids, and their tone increaſe; the imagination, and the other faculties of the mind are daily more and more developed, and the ſexual inſtinct is excited: ſtill no decay is obſerved; but on the contrary, the youth appears to increaſe, ſo much energy is there required for performing the offices, aſſigned to us by nature.

All the parts thus become gradually evolved, and the ſolids continually acquire more tone; hence a little after the youth has arrived at the term of his growth, or to man's eſtate, all the functions of the body are exerciſed with the higheſt vigour, and conſtancy; and as to the faculties of the mind, to make uſe of the elegant phraſe of Blumenbach, "the grand prerogative of a more mature judgment belongs to this period of life;" but the texture of the brain growing partly rigid, the memory is already in ſome meaſure diminiſhed, and the habit appears more robuſt and ſolid. For the reſt, no mark of decay can be perceived, but the ſerpent is hidden beneath the graſs: for, ſince the ſame cauſes continue to act, the parts, which no more admit of evolution, are daily more indurated; the veſſels become more narrow, and, in fine, totally conſolidated; and the muſcles acquire the hardneſs of the tendons. But the ſolids being grown ſo ſtiff, it follows of courſe, that all the vital powers muſt likewiſe decreaſe: hence the nerves become more and more deadened to the impreſſions of the ſenſes; the muſcles obey but ſluggiſhly the impulſe of ſtimuli; and the irritable power of

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the heart, and of the whole ſanguineous ſyſtem, together with the number of pulſations, is greatly diminiſhed; but the irritability being leſſened, the blood is no longer propelled to the minuteſt veſſels; therefore innumerable veſſels are gradually obliterated, and the proportion of the fluids to the ſolids becomes unequal; at length, from the great alteration in the ſtructure of the ſolids, the humours alſo are obſerved to be more compact and thick. This is the delineation of green old age.

But, as the ſame cauſes continue to operate, this green old age changes into decrepitude, which is attended with an arid and dry habit, increaſing dullneſs both of the external and internal ſenſes, and the want of longer ſleep *; ſexual enjoyment has long vaniſhed; the re-action of the organs when ſtimulated grows ſluggiſh, and all the functions are very ſlowly performed. Hence, the inteſtines, having almoſt loſt their irritable power, retain for a long time the *fæces*: from the ſame ſource all the ſecretions are diminiſhed and very heavily performed; the heart beats ſcarcely half the number of pulſations which were found in the new born infant, or even when a year old, ſo that in a minute not even ſixty may be counted; the hair becomes gray, and partly falls off; the teeth drop out; neither can the neck ſuſtain the head, nor the feet the body, in a proper manner, from the rigidneſs and inſenſibility of the muſcles; even the bones, the ſupporters of the whole frame, are, as it were, conſumed. In fine,

* See a very clear inſtance by HALLER, *Element. Phyſ.* T. viii, lib. 30, ſect. i, §§ 22.

man

man is led on to the laſt term of all things, death, without ſickneſs: for the human body growing more and more rigid, and the vital powers becoming in the ſame manner diminiſhed, the heart and the blood-veſſels can no more propel the blood to the extreme parts; therefore, pulſe or warmth can ſcarcely be obſerved in the hands and feet of decrepit men. The blood is ſtill carried from the heart to the veſſels, and back again, by which the feeble ſpark of life is yet fed, though juſt about to be extinguiſhed, when the heart itſelf, having at length attained the extreme of rigidity, becomes inſenſible to the ſtimulus of the blood; at leaſt it can no longer be incited to a ſufficient contraction, as, for want of irritability, the blood is not propelled through the lungs. Thus the left, or poſterior ventricle of the heart, receiving no more blood, ceaſes to live; whereas the right ventricle remains yet for a ſhort time alive: becauſe, after the laſt expiration, the blood returning by the great veins is impeded in it's paſſage to the lungs, which are already collapſed: however, the right ventricle of the heart having attained the ſame degree of rigidneſs and inſenſibility as the left, after ſome ſtruggles it alſo leaves off acting, and ſo complete death is uſhered in. Thus, in my humble opinion, the inevitable deſtruction of the human frame ſhould be derived from the continually increaſed tone of the firm parts, and rigidneſs and inſenſibility to ſtimuli thence acquired by the body. Common life proves, by numerous inſtances, that theſe alone are the cauſes of dying from old age, or euthanaſy, and that here attrition can by no means be taken into the account. Let us only examine the hands of bricklayers, carpenters, black-

ſmiths, and ſuch men; let us compare the hard-worked hands of a blackſmith with thoſe of a fine delicate lady; how great a difference do we not find! Are the hands of this man, though continually expoſed to attrition from the ſevereſt labour, more delicate than thoſe of the lady? By no means: on the contrary, they are much harder, covered with a callous cruſt, and not ſeldom inſenſible even to the ſtimulus of fire. This is to be accounted for from the law of nature, that the more all the parts of the body are exerciſed, the greater abundance of blood they draw to them, and the ſooner they increaſe; but in a ſhort time arrived at the ſummit of increment, they become rigid, inſenſible, and unable to act. So, for inſtance, in the ſame ſpace of time more ſemen is ſecerned in a voluptuous man, than in a chaſte one, though the latter far ſurpaſſes the former in ſtrength; the brain in thoſe who cultivate the faculties of the mind, where all other requiſites are equal, is found much more evolved than in thoſe who neglect it's cultivation: nevertheleſs, rigidneſs and inſenſibility, unleſs prevented either by accidental cauſes, or by a proper regimen, much ſooner happen to the cultivated parts than to the uncultivated.

I could adduce a thouſand examples in ſupport of this, were it not, that the deſign of this treatiſe does not admit of it, and the two I have publiſhed ſufficiently prove it. But, perhaps, it may be argued by the advocates of the humoral pathology, that the rigidneſs and inſenſibility of the ſolids cannot alone be the cauſe of death from old age; for, if it were ſo, farmers and common people,

who continually exercise their bodies, would grow sooner rigid, and live shorter lives, than learned and idle men; whereas it appears, that in general they live much longer. This objection, though seemingly very strong at the first appearance, upon a nearer view proves nothing against my opinion: for the constitution of the human body being different in every individual, the natural inference must be, that the degree of rigidness requisite to death cannot be the same, and, according to the various constitutions of bodies, must greatly differ. Thus as a morbid stimulus of a certain violence is requisite for the destruction of life; but the degree of this violence is very different in various persons, so that the life of one will be extinguished by a noxious power, which in another is able to produce only a slight disease; so likewise a certain rigidness of the solids brings on death, but in such a manner, that, according to the various constitutions of persons, the same degree of rigidness in one will destroy the vital principle, when, in another, it will only occasion a slight disorder. Therefore farmers may still live in a pretty healthy state, in the same degree of rigidness, which suppresses the vital principle in men of a tender and delicate constitution. As to the consumption of the bones, called that of old age, it is beyond all doubt, that not only the small bones, as for instance, the os unguis, but also all the others, though very thick, are consumed in the state of old age, and become specifically much lighter. This phenomenon, however, is not in the least owing to attrition, but ought to be explained from another law of nature, no less general than the former, according to which all the parts, which no

longer ſerve for any uſe, are leſſened both in ſize and weight; the action of the abſorbent veſſels being incited, as ſoon as any living part is grown of no utility. Thus the breaſts, as is known, are diminiſhed by age. It is proved by many phenomena in nature, that this alſo happens in youth. The eyes of blind perſons, together with their orbits, are found, even in youth, much ſmaller than ſound eyes, and the arms and legs when rendered uſeleſs by a paralytic ſtroke, though the patients are in other reſpects healthy, and of no advanced age, are always found, if the diſorder have been of ſome ſtanding, arid and extenuated.

In fine, the hiſtories of longlived men, as alſo the cauſes ſerving beſt to prolong life, confirm what I have ſaid above on the cauſes of death. For though there exiſts no living body that can avoid death, yet there are many cauſes which can prolong life, or ſhorten it, ſince whatever either contracts the fibres, or acts with too much violence, brings on rigidneſs, and with it death:—while, on the contrary, thoſe cauſes which prevent rigidneſs, or at leaſt retard it's progreſs, ought to be looked upon as ſo many cauſes of longevity. Thus hard drinkers and voluptuous men, if they ſometimes arrive at old age, grow ſooner rigid than others; and for the ſame reaſon the choleric, the learned, &c. are generally found to be of ſhort lives. Indeed it has long ago been proved, that there is no affinity between the faculties of the mind and longevity; and that, on the contrary, fools are very often longlived, which the illuſtrious Haller ingeniouſly explains in this manner; "fools want cares, and peaſants are little

ſubject

" ſubject to ſorrow, who, free from the ambition of " genius and dignity, neither grow lean from vexa- " tion at the paſt, nor anxiety for the future *." All theſe cauſes, though acting in a quite different manner, bring on rigidneſs: as, on the other hand, thoſe who are temperate in eating, drinking, and not addicted to violent paſſions; in a word, who are moderate in all things, and are provided with a more ſucculent and not very irritable conſtitution, generally protract life longer than others; and CORNARO, at a hundred years of age, has taught by his example, what a proper regimen is capable of effecting even in a weak conſtitution.

* L. 1. p. 116.

CLASS II.

Death from the Passions of the Mind.

AFTER explaining the cauſes of death from old age, I next proceed to treat of various ſtimuli, by the violence of which the vital principle is extinguiſhed. Among theſe I begin with the paſſions of the mind; ſince, though they are obſerved without occaſioning ſickneſs in all men, yet by violence of action they become ſo many morbid ſtimuli, and thus afford a natural tranſition to diſeaſes themſelves. The diſturbances of the mind, with reſpect to the effects produced in the animal economy, are divided into *exciting*, and *depreſſing*. To the former belong joy, love, hope, anger, &c. To the latter, grief, hatred, envy, fear, and terrour. It does not come within the compaſs of this treatiſe to ſpeak ſeparately of all theſe; ſince the paſſions in general are here conſidered merely as far as by their violence death is occaſioned. I ſhall take notice therefore of three only; joy, anger, and terrour; as the others, by conſuming the vital powers, in reality bring on deſtruction, but by no means directly extinguiſh life itſelf.

ORDER I.

The exciting Paſſions of the Mind.

GENUS I.

Joy.

THERE is no doubt, but that man can die of too much joy, ſince it is proved by the teſtimony of authors of credit, that many are carried off in ſuch a manner; of which I ſhall here give ſome inſtances. Chilo, the ſpartan, one of the ſeven wiſe men of Greece, beholding his ſon crowned at the olympic games, embraced him, and in the ſame moment fell dead. Valerius Maximus relates, that Sophocles, a tragic poet, celebrated for the ſweetneſs of his verſes, being aſſigned the prize in tragic poetry, inſtantly breathed his laſt. We read in Livy, that, when Hannibal had vanquiſhed the romans in the battle of Cannæ, two women, ſeeing their ſons returning in good health, after they had believed them to be dead, immediately died of joy. The ſame happened to a lady, the heireſs of the famous Leibnitz, from the joy ſhe felt at unexpectedly finding a heap of money *. The immortal Boerhaave records, that a pirate died of joy, on being informed, that his ſon, who he thought had periſhed, was not only well, but had alſo been promoted to the higheſt dignities †.

* *Dans la Vie de* Mr. Leibnitz, *miſe devant ſes Eſſais de Théodicée.*

† *Prelect. Acad. de Morb. nerv. edit.* Van Eems, Tom. ii, *de Sympathia,* p. 455, and 56.

But it is not so easy to explain, how man dies of too great joy; as there are no dissections of such bodies, that I know of. We find indeed in the *Miscell. Naturæ Curios.* a dissection of such a body, performed by Dr. Vater; but as this author has written, that he found no unusual appearance, except that the pericardium was greatly distended with coagulated blood, nothing can be concluded as to the cause of death, from this dissection *.

Thus there remains no way of ascertaining it's cause, but by an accurate inquiry into it's nature and symptoms. No body will question, but that the sense of joy affords a grateful stimulus, the effects of which, when not immoderate, are always salutary. All authors agree, that moderate enjoyment contributes greatly to health and longevity; and that the human body reaps no little benefit from it's slightly exciting power: for the circulation of the humours, principally of the blood, thence becomes more free, the pulse quicker, and all the secretions and excretions well and quickly performed. But when this stimulus attacks unawares, and with great violence, it's effects are quite different; for the blood, then driven with the utmost rapidity through all the vessels, oppresses the heart in such a manner, that, unable to receive it on account of it's debilitated muscular power, this organ incurs a fainting fit, which therefore mostly accompanies too great and sudden joy: but, and this is the chief cause, as the blood is carried through the whole body with so great a velocity, it is also more

* *Miscell. Curiosor.* dec. 3, ann. 9, p. 293.

copiously

copiouſly conveyed to the brain, which, from it's delicate texture, cannot ſuffer ſuch violence without the greateſt injury, and the more, as on account of the languiſhing irritability of the heart, the flowing back from the head is impeded. It ſeems, therefore, very probable, that men dying of too great joy are deſtroyed by an apoplexy; as, by the blood's being accumulated in ſo great a quantity in the brain, this organ becomes oppreſſed, and a rupture of the veſſels of the brain takes place, and in this caſe an apoplexy muſt be the conſequence.

This opinion of the cauſe of death from joy is held by two accurate obſervers of nature, Haller and Gaubius; the firſt of whom, ſpeaking of ſuch a death, ſays: "We do not well know how it happens; yet it may be ſuſpected, that an apoplexy is brought on, the impulſe of the blood on the brain being increaſed; and the redneſs, warmth, and faintings, give room for this opinion *."

Gaubius has expreſſed this notion ſtill more clearly: he tells us, that "Joy is attended not only with an increaſed, and quickened circulation, ſecretion, and excretion; but with inſanity, the relaxation of the powers, and even with a mortal apoplexy when too great and unexpected †."

Thus it appears, both from the nature of the paſſion, and from it's ſymptoms, that joy kills merely by means of too great a quantity of blood oppreſſing

* L l. t. v, lib. 17, ſect. 11, § 5.

† Inſt. Pathol. § 542.

the

the brain: and this is the reaſon, why no one dies of joy, even though extreme, when not arriving unexpectedly; as the quality of the blood is not altered from the healthy ſtate by this paſſion, which proves fatal only from the inordinately accelerated circulation, and congeſtion of the blood in the brain.

GENUS II.

Anger.

THE other diſturbance of the mind, belonging to this order, is anger. This ſtrong paſſion, totally different from joy, incites all the organs to action, not in a placid manner, but with the utmoſt violence: whence, even in a ſlight degree, it contributes nothing to longevity, but, on the contrary, is always injurious to choleric and ſanguineous men; though the venerable father of phyſic, and many others aſſert, that anger, if not too vehement, has often effected much good, by the force with which it acts on the whole body in men of a cold conſtitution, principally when in a morbid ſtate, as in pituitous diſeaſes, and palſy *. Anger, when excited in a greater degree, extinguiſhes the other paſſions by it's violence, and ſo powerfully affects the body, that not only a bad bile is ſecerned, but beſides the other humours are converted into poiſonous liquids inſtead of bland juices †.

* Hippocrates *Epidem.* lib. ii, ſect iv, et Horſtius, lib. ii, *conſ. epiſt.* xii.

† F. Dejean *Commentaria* in Gaubii *Inſt. path.* t. iii, § 542, and the firſt part of this treatiſe.

Although

Although, from what I have hitherto ſaid of the nature of anger, it ſeems right to conclude, that it ſurpaſſes joy in deadly effect, and indeed, if no greater, at leaſt an equal number of men die by it's violence; nevertheleſs, in moſt caſes it rather produces mortal diſeaſes, than directly occaſions death by itſelf. Anger differs thus from joy, not only as to it's cauſes, and manner of acting; but, alſo, as to the celerity of it's effect. This difference, on comparing the two paſſions together, may be explained thus:

Joy, though in the higheſt degree, never either ſo violently ſtimulates to act, or, like anger, gives ſo great a force to the veſſels of the heart, lungs, and brain, as that they can repeatedly propel the blood: whence fainting and apoplexy are very ſeldom obſerved to ariſe from anger, becauſe in this paſſion, the heart, and the veſſels of the lungs and brain, are ſo irritated by receiving the altered blood, that they contract themſelves with the greateſt force, and repel it from the centre to the ſurface. The blood is thus, both in anger and joy, driven to the heart, lungs, and brain in a greater quantity: but as in anger the veſſels, on account of their increaſed force, make the greateſt reſiſtance to the blood, and violently contract themſelves at the ſtimulus, it is again directly conveyed to the ſurface.

Yet, though anger for the moſt part does not inſtantly kill, and the examples of a ſudden death occaſioned by it are few, it is not leſs injurious than joy. On the contrary, in bad effects it ſurpaſſes all the other diſturbances of the mind: for it

is proved by the illuſtrious Hoffmann, that, beſide many other diſorders of the gall-ſyſtem, and the firſt paſſages, nothing can ſo ſoon excite a bilious, or a bilious inflammatory fever, as violent anger *. Beſides, ſuch fevers are very often accompanied with topical inflammations, which, being erythematous, and generally ariſing from vitiated bile, are much more dangerous than true ones, and ſooner change into gangrene: for daily experience ſhows, that erythematous inflammations are more apt to terminate in mortification, than the true ones.

It is obvious, that, according to the different degrees of anger, the different conſtitutions of the ſick, and the various afflicted organs, the ſymptoms muſt differ greatly; but, as I am conſidering the paſſions only with reſpect to their manner of bringing on death, I cannot take notice of theſe differences: I ſhall, therefore, directly paſs on to the explanation of death from anger.

That a ſudden death, though it ſeldom happens, may be occaſioned by anger, Dr. Bruhier proves by the following example. A woman being ſeized with a fainting fit, in conſequence of violent anger againſt her child, inſtantly expired. This caſe, according to the phenomena of anger, may be thus explained: In angry perſons the breathing is quick, the inſpirations are ſhort, and very incomplete; as the thorax, on account of the ſtrong ſpaſmodic contraction of all the irritable parts, cannot be duly di-

* F. Hoffman *Opera omnia*, t. ii, part 2, *de Pathologia generali*, cap. 1, § 12, in ſcholio.

lated

lated. The more violent the anger, the greater it's effects upon the organs of reſpiration: hence an angry perſon in a ſhort time begins to pant, and can ſcarcely draw his breath; and if the paroxyſm of anger do not ceaſe, but be increaſed, or continued by any cauſe, the breathing becomes wholly impeded; ſince the blood is then ſo accumulated in the lungs, that they cannot ſuſtain, and propel it, for the veſſels of the lungs, being ſtretched beyond their tone, loſe their energy, and a congeſtion of the blood taking place, they can no more receive the blood from the right ventricle; thus it flows back, and oppreſſes it; a fainting fit follows; the breathing becomes more and more impeded; and at laſt both from the too great quantity of blood, and it's altered quality, the breath is totally ſtopped; ſo that by a violent fit of anger the patient is ſuffocated.

ORDER II.

The Depreſſing Paſſions of the Mind.

GENUS I.

Terrour.

I AM humbly of opinion, that terrour ſhould be ranked in this order, though Haller, and many others, have referred it to the exciting paſſions. I ground my opinion upon the ſymptoms of terrour, for it's main effect is a ſpaſmodic contraction of the external parts, by which the blood is propelled from the ſurface to the centre: therefore, this paſſion throws the

the heart into palpitation; oppreſſes the lungs; diſpoſes to diſeaſes ariſing from the impeded ſecretions and excretions; produces emptineſs of the veſſels, weakneſs and quickneſs of the pulſe, paleneſs, coldneſs, congeſtions, and even abortion; ſuppreſſes the evacuations; and ſuddenly kills *.

Nobody will queſtion, but that theſe ſymptoms are ſo many arguments ſupporting my opinion, and upon a due examination of the objections made againſt it, theſe will be found, I think, totally groundleſs; for the re-appearance of the menſes, hemorrhages, inflammations, diarrhœa, ſudden overflow of the bile, and all the other effects, which, according to the aſſertion of the illuſtrious Haller †, are ſometimes obſerved from terrour, ought not to be imputed to terrour alone, but to deſpair, a paſſion compounded of terrour and anger; as will appear upon an accurate inquiry into ſuch caſes, and from the nature of theſe ſymptoms itſelf. Thus it is evident, that, treating of the paſſions ſingly by themſelves, none of the enumerated ſymptoms can come into the account; yet I do not deny, but that ſome of them, in caſes wherein only a ſlight degree of terrour takes place, ought to be derived from the re-action of the vital powers, by which the reflux of the blood to the ſurface of the body is ſuddenly occaſioned.

The other of Haller's objections does not appear to be of greater weight. It is, that terrour agitates

* Hoffman. *Opera omnia*, l. l. from § 19 to § 24.

† *Elem. Phyſ.* t. v, lib. xvii, ſect. ii, § 6, p. 586.

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the nervous ſyſtem, and brings on ſpaſms, convulſions, and even the epilepſy: for it is by no means inconſiſtent, that from a depreſſing paſſion ſhould ariſe diſeaſes, in which, during their paroxyſm, an exceſs of the vital principle takes place; and the tranſition from the firſt ſtage of the intermitting fever to the ſecond ſhows, almoſt every day, that this happens.

It was well known to the ancients, that ſudden death is often the effect of great terrour. We read in Pliny, that Publius Rutilius inſtantly expired, on hearing, that his brother was rejected, when a candidate for the conſulſhip *. Many ſuch inſtances might be adduced from more modern authors; but for brevity ſake I ſhall confine myſelf to two. The illuſtrious Lanciſi relates, that "an old and "weak nobleman, while at ſupper, was ſud-"denly carried off by an apoplexy, on unex-"pectedly receiving a meſſage of the unwiſhed for "arrival of one of his relations †." The other is found in the *Philoſophical Tranſactions:* a large vigorous dog, rouſed from ſleep by the exploſion of cannon, ran up and down till he fell dead, the blood flowing out of his mouth ‡. From theſe ſymptoms the manner of dying from terrour will not be difficult to explain: for the veſſels of the ſurface being conſtricted, and the blood driven to the internal organs, it copiouſly ruſhes to the heart, lungs, and

* *Hiſtor. Natural.* lib. vii, cap. xxxvi.

† *Opera omnia*, t. i, de *ſubit. mort.* lib. i, cap. xi, § 12.

‡ *Phil. Tranſ. Abridg.* by Boddam, vol. 3, p. 232.

brain

brain, which thus become oppreſſed; therefore, if either the paſſion be too violent, or the body weak, the organs, unable to ſuſtain ſuch a ſhock, no longer propel the blood, but leave off acting. The more feeble any organ is than the others, the greater the force with which the blood is driven to it, and the ſooner it is oppreſſed. Thus, though all who are deſtroyed by terrour die unawares, the remote cauſe of death differs in various perſons; according as the brain, the heart, or the lungs are more weak; ſo that they expire either by apoplexy, by fainting, or by ſuffocation: yet moſt are carried off by an apoplectic fit.

CLASS

CLASS III.

Death from Abundance or Want of Caloric.

ORDER I.

Death from the Abundance of Caloric.

GENUS I.

Too great Heat.

ALTHOUGH it is at preſent proved beyond all doubt, that the opinion of Boerhaave *, that man cannot live in an atmoſphere, ſurpaſſing in fervour his animal heat, is by no means founded on the obſervation of nature; as, on the contrary, it is rather one of the greateſt prerogatives of man, that, confined to no zone, he can live throughout the whole terraqueous globe, and ſupport both the rigours of *Nova Zembla*, and the ſcorching heat of *Senegal*: nevertheleſs, he is not able to bear every degree of heat; therefore in very hot countries he is extremely liable to many diſeaſes; ſuch as phrenſy and tetanus, which are very common in thoſe countries, particularly when a man is expoſed for a long time to the ſcorching ſun. If this heat, already exceſſive, be farther increaſed by any cauſe, life ſuddenly ceaſes. It is indeed true, that ſome men have ſuſtained a very conſiderable degree of heat during a few minutes, yet there is no doubt, but that they

* *Elementa Chemiæ*, t. i, *pt. altera*, p. 192, L. B. 1732, 4to.

would have died, if ſuch heat had been continued for ſome length of time.

But the manner of dying of ſuch men is not ſo evident. If we may be permitted to conclude by analogy, from the effects of a ſmaller heat to it's greater degree, the ſtimulus of heat, ſo favourable to the animal economy, when in a ſlight degree, and mildly inciting all the organs to act, in a greater degree produces quite contrary effects, operates as a ſedative, depreſſes, and, when in any way increaſed, deſtroys life. This explanation is ſupported by the phenomena, which we experience during the exceſſive heats of ſummer, though living in a temperate climate: for how feeble and torpid do we feel ourſelves, both in body and mind, during ſultry hot weather! This opinion will be farther confirmed, on comparing the phenomena with thoſe common to the inhabitants of the torrid zone: for their muſcles are obſerved to be flaccid, ſoft, and inactive; in a word, their whole frame announces a torpor of the vital power, and the vigour of the mind decays together with the energy of the body; ſo that, according to the unanimous teſtimony of all travellers, both are ſcarcely capable of any thing, but voluptuouſneſs and pleaſure. If it be aſked, by what means the deſtruction of life is produced by heat; I anſwer, that, from the phenomena of heat, it ſeems to me probable, that the veſſels of the ſurface being deprived of their tone by the extreme heat, the blood is conveyed in a greater quantity to the internal organs, which, having themſelves loſt a great deal of their energy, and being ſcarcely able to propel the vital fluid, are entirely oppreſſed by the

blood

blood arriving from the ſurface, and ceaſe to perform their functions. According to the various accidental circumſtances, the blood will deſtroy the function of either the heart, lungs, or brain; yet, I think, that, on account of the delicate texture of the brain, for the moſt part an apoplectic fit puts an end to life.

However, it ought to be obſerved, that what I ſay here of the effects of heat is true only when moiſtneſs accompanies the hot temperature of the atmoſphere: but if, on the contrary, the air be hot and dry, the inhabitants, though not ſtrong, are active, and endowed with many faculties of the mind, and in this caſe they do not die of torpor, but of the ſtimulus of heat grown too violent to be reſiſted by the ſolids.

For want of obſervations I cannot determine, whether the vital principle be inſtantaneouſly extinguiſhed in all the organs by the violence of the ſtimulus, or death be uſhered in by the oppreſſion of ſome particular organ.

GENUS II.

Burning.

WHEN the heat is increaſed to 212° of the thermometer of Fahrenheit, or to the temperature of boiling water, it's effects are called burning. Such a degree of heat, being but for a moment communi-

cated to the body, greatly inflames it's habit, and if either this degree of heat be augmented, or the ſame degree remain applied during a longer ſpace of time, the organical compoſition of the human body becomes entirely deſtroyed. But though the effects of burning greatly vary on account of the different intenſeneſs of the heat applied, yet it's prognoſtic depends not only upon the degree of burning, but alſo upon the extent of it, ſo that, as Dr. Richter juſtly obſerves *, a burning of a ſmall extent, though deeply ſeated, may often be unattended with danger, and, on the contrary, a ſuperficial burning, extending over almoſt the whole ſurface, may be even mortal.

Where a man dies by burning, the cauſe of death ought to be looked for in the ſuppreſſion of reſpiration, and the other vital functions, by the violence of the heat: however in moſt caſes he is killed not by the burning itſelf, but by it's effects, which are either a violent inflammation, a ſpaſm, an abundant ſuppuration, bringing on conſumption, or gangrene, of all which I ſhall take notice in the third part of this treatiſe.

* *Anfangsgrunde der Wundarzneykunſt*, erſter band, das funfte capitel, § 200.

ORDER II.

Death from the Want of Caloric.

GENUS I.

Too Intenſe Cold.

AS we have ſeen above, that a man may die of the exceſs of heat, in like manner the want of a ſufficient quantity of caloric can occaſion death; which may readily be explained from the nature of cold itſelf. This, when in a ſmall degree, acts on our bodies like an exciting ſtimulus, augments the tone of the ſolids, and the motions of the fluids depending upon it: all the functions are performed with greater effect, and the vigour of the vital principle is increaſed; therefore, the animal heat almoſt continually preſerves the ſame degree, whether a man live in a very cold climate, or in the torrid zone; and his heat is even frequently augmented, when we are expoſed to a cold atmoſphere, as the energy of the veſſels, which evolve the caloric, is increaſed by the cold. But when the cold is in a greater degree, it becomes a dreadful evil, and produces an ungrateful irritation of the nerves, a contraction of the breaſt, ſhiverings, tremblings, paleneſs, and rigor of the whole body. If ſuch cold be either increaſed, or even continued, not only all the phenomena of the ſecond degree of cold, as it were, are incited, ſo that the ſolids become rigid and inflexible; but alſo numbneſs, diminution and ſuppreſſion

of ſenſe and motion, difficulty and oppreſſion of the circulation, anxiety, and, at length, an invincible propenſity to ſleep, the forerunner of approaching diſſolution are obſerved: for if a man, inſtead of reſiſting the effects of this higheſt degree of cold by continual motion and exerciſe, yield to the wearineſs and ſleepineſs it induces, he is in the greateſt danger of his life. Of this we have a memorable inſtance in ſome dutch ſailors, who, going to the whale fiſhery, and being confined by the ice at Spitzbergen, remained in good health as long as as they could go out of their hut, and continually reſiſt the cold by hunting, and other exerciſes; but as ſoon as their hut was covered with ſnow, and they were thus ſhut up in it, they were attacked with a torpor, increaſing every day for want of motion, till at laſt all were killed by the cold.

It appears from the phenomena of cold, that the veſſels of the ſurface contract themſelves, and even collapſe for want of the fluids, which are driven to the centre by violent cold: hence the deepeſt anxiety and palpitations of the heart enſue; the blood cannot paſs through the lungs without difficulty, both on account of the inordinate motion of the blood, and becauſe the lungs themſelves are directly expoſed to ſo ſtrong a degree of cold. But the vital organs being oppreſſed by the blood, it muſt follow, that their functions will be impeded; as the texture of the veſſels of the brain is the moſt delicate, and the force of the noxious power is always in proportion to the ſtructure of the affected organ, an apoplectic fit, if not always, at leaſt in moſt caſes, will extinguiſh life; this, which might already with

ſufficient

sufficient certainty be concluded from the symptoms of cold, and it's manner of acting, is confirmed by a dissection, performed by Dr. Quelmaltz, of a man, who died of cold at the age of seventy *.

* *Progr. de Frigoris acrioris in Corpus Effectibus. Lipsiæ*, anno 1755.

CLASS IV.

Death from the Electric Shock.

GENUS I.

Too great Electricity.

IF the ſtimuli were to be ranked according to their quickneſs in deſtroying life, lightning certainly ſhould deſerve to be mentioned the firſt; for it extinguiſhes life not only with a ſingle ſhock, but ſo, that, though the moſt powerful ſtimuli be inſtantly applied, the leaſt ſpark of life no more appears in any organ, as is proved by the inſtance of the famous ruſſian profeſſor Richman, and many others *.

But the manner of dying by lightning was long involved in obſcurity, becauſe there was no way known to kill animals with a ſingle ſhock of artificial electricity, as by lightning, till the learned Dr. van Marum made ſuch experiments with the electric machine of Teiler, that there now remains no doubt of the true manner of dying in theſe caſes; for repeated experiments taught him, that the cauſe of death conſiſts in a ſudden and total extinction of the vital principle. This happens not only in animals of hot blood, but alſo in thoſe of cold blood,

* *Phil. Tranſ.* vol. xlix, part 1, p. 61.

though

though they are in other caſes endowed with a more tenacious life, and the peculiar life of their organs remains many hours after death.

I ſhall in a few words relate ſome of the doctor's experiments, that it may appear, how juſtly he has thence drawn his concluſions. To determine this queſtion, he made trials upon eels; as it might with propriety be inferred, that electricity would aboliſh the vital principle in other animals, if it could effect the extinction of life in this, as being of cold blood, and extremely tenacious of life: whereas no general concluſion could be drawn, if he had made uſe of animals of hot blood. The doctor made the firſt two experiments with eels eighteen inches long, and the electric fire was led through the whole length of the animals: after the exploſion they inſtantly lay motionleſs, and though tried with various ſtimuli, and even with *ammonia*, they never ſhowed the leaſt marks of life; which proves, that the vital principle of theſe animals was totally extinguiſhed by the electricity. In the other experiments, which were alſo made upon eels, but longer than the former, ſo that one of them was thirty-ſix inches in length, the electric ſhock was only led through a part of the body, after which the part not ſtruck continued alive *, experience ſhows, that the ſame happens to a man, when the lightning has ſtruck only a part of the body, not in the middle of the chain.

The phenomena obſerved in thoſe ſlain by lightning, and the diſſections of ſuch bodies, perfectly

* *Algemeene Kunſt- en Letter-bode*, anno 1790, N. 93.

agree with this cauſe of death; as no mark of any diſorder is ever found, to which ſo ſudden a death could be imputed; but, on the contrary, the brain, heart, lungs, and all the other viſcera, are always obſerved to be either ſound, or only in a ſlight degree injured, and nevertheleſs no ſtimulus whatever has the leaſt effect; nay the blood is always found to be in a diſſolved ſtate, which phenomenon ſeems owing to this, that the veſſels, deprived of life in a moment, are unable to produce it's coagulation.

Thus it appears, that the electric ſtimulus, though ſpecific, and quite different from all others in it's nature, agrees with the others in this, that, exciting the vital principle, and promoting all the functions, when in a ſlight degree, it affords a powerful remedy in many chronical diſeaſes, and does not ſeldom cure even the palſy; but, when in a ſtronger degree, it diminiſhes, and deſtroys life.

CLASS

CLASS V.

Death from all Kinds of Gas noxious to the Animal Economy.

I BRING into this claſs all kinds of *gas*, which do not contain the due proportion of oxygen for reſpiration, or which, though containing it, ſuffocate by their peculiar ſtimulus. Inquiring into the manner of dying by theſe *gaſſes*, I divide this claſs into three orders; as they all hurt either by the ſuperabundance of oxygen, by the want of it, or by their peculiar ſtimulus.

It ſeems to me better to conſtitute a different claſs for theſe kinds of gas, than to compriſe them under the ſame claſs with the poiſons; as moſt of them are mortal only by inſpiration, and the reſt, whether internally taken or externally applied, are by no means injurious.

ORDER I.

Death from Gas mortal from too much Oxygen.

GENUS I.

Pure Oxygen Gas.

IT may perhaps be judged by ſome phyſicians, that I have improperly ranked oxygen gas among the

the noxious ſpecies; as not only is the quality of the atmoſphere commonly deemed more or leſs wholeſome in proportion to the oxygen gas contained in it, but alſo the greateſt naturaliſts, and among them the celebrated Ingenhouſz, obſerving that diſeaſed men are often relieved by a freer acceſs of air, and by a ſea voyage, have recommended this *gas* to phthiſical patients, and to thoſe attacked with a ſhortneſs of breath, or labouring under an acute fever *; in expectation, that theſe diſeaſes would be totally removed, or at leaſt greatly relieved by the inſpiration of the *gas*. Experience, however, has proved theſe expectations futile, and the experiments made by Dr. Girtanner ſhow, that this *gas* is not only found uſeleſs in ſuch caſes, but, on the contrary, brings on a quicker decay to the patients; for, though indeed the phthiſical breathe much freer in the commencement by it's uſe, the hectic fever becomes thence augmented, and the ſick die much ſooner than otherwiſe †. This will not ſeem wonderful, when we conſider, that an animal, ſhut up in an air pump filled with pure oxygen gas, immediately breathes much faſter, the breaſt becomes fuller and more frequently dilated, the irritability of the heart and blood-veſſels is increaſed; in a ſhort time the animal grows feveriſh, and it's natural heat is found to be greatly augmented; theſe phenomena grow more and more threatening, all the ſymptoms of a violent inflammatory fever come on,

* Ingenhouſz *Verſuche mit Pflanſen, Theil* 1, p. 373. *Wien* 1786. 8vo.

† *Anfangsgrunde der Antiphlogiſtiche Chemie*, capitel 36.

and

and at length the animal, incapable of breathing on account of the lungs being ſo much inflamed, dies of ſuffocation *. Thus it appears, that, as a candle, though burning in oxygen *gas* with a more vivid flame, far ſooner burns out in it, than in the atmoſpherical air; ſo a man, making uſe of oxygen gas, though breathing more freely, would yet in a ſhort time yield to the violence of the ſtimulus. Hence we may admire the wiſdom, with which Nature has compoſed our atmoſphere, not of pure oxygen gas alone, but alſo of azotic and carbonic acid gas.

ORDER II.

Death from Gas mortal for Want of Oxygen.

GENUS I.

Azotic Gas.

THIS *gas*, unfit for reſpiration, ſuddenly ſuffocates animals for want of vital air. As the proportion of the oxygen gas in the atmoſphere is continually diminiſhed by the breathing of animals, and the carbonic acid gas produced by reſpiration is as little able to ſuſtain animal life, as azotic gas itſelf; it follows of courſe, that the ſame portion of air, often inſpired, at length becomes unfit for reſpiration, and muſt bring on death. And indeed, as ſoon

* L. 1. p. 230.

as

as the oxygen, contained in the atmoſpherical air, is nearly conſumed, the lungs partly collapſe for want of the uſual ſtimulus, and are partly impeded from acting by the poiſonous ſtimulus of this *gas*. Hence they can no longer perform their office, but ſuddenly deſiſt from their functions, and death is brought on. From this we may readily perceive the reaſon, why the air is ſo often contaminated, when many perſons are long ſhut up in a ſmall compaſs. The chief antidotes againſt this gas are the bringing of the patients into cold air, plunging them into the cold bath, the inſpiration of vital air, and the uſe of vinegar taken in a large quantity.

GENUS II.

Hydrogen Gas.

THOUGH this *gas* does not belong to the conſtituent parts of the atmoſpherical air, it nevertheleſs deſerves great attention, as many men are killed by it's vapours, and ſtill more afflicted with very dangerous diſeaſes. Diſtinguiſhed by it's inflammable property from all the others, it is much lighter than the atmoſpherical air, has a peculiar and ungrateful ſmell, and is quite unfit for the breathing of animals, and for feeding flame. It is produced by nature in many caſes, though moſtly joined with other ſubſtances; hence a diſpute formerly aroſe among the chemiſts, whether there did not exiſt many ſpecies of this *gas*. At preſent, however, it is clearly proved by the experiments of the celebrated

brated Macquer, and Fourcroy *, that there is only one inflammable air, but which has various modifications, and is endowed with various properties, according to it's conjunction with various matters. Among these the four following, as being the most common, deserve chiefly to be noticed: viz. 1. *Sulphurised hydrogen gas.* 2. *Carbonated hydrogen gas.* 3. *Phosphorated hydrogen gas.* 4. *Hydrogen gas combined with azote and carbonic acid.* I shall briefly treat of each of these modifications, as serving to explain many phenomena in nature.

SPECIES I.

Sulphurised Hydrogen Gas.

THIS *gas* may be counted almost among the common products of nature; for as often as water, iron, and sulphur can act on each other, in places under ground, so often is the water decomposed, and both sulphate of iron, and sulphurised *hydrogen gas* are produced: hence ought to be derived the origin of the mineral waters which contain sulphur, and that of burning mountains; as also the explanation of the singular phenomenon, that these mountains are never found at a great distance from the sea, but always in it's vicinity; because water is requisite to their explosion.

* *Macquers chemisches Worterbuch mit zusachen von* Leonhardi *zweyter* theil, p. 474, *Leipsic*, 1778; and Fourcroy's *Élémens d' Hist. Nat. & de Chémie*, t. ii, troisième section, capitre iii, p. 327.

The

The vapourous cavern of *Pyrmont* belongs to the mineral waters containing this gas. That famous cavern ſuddenly kills inſects, birds, in a word all animals inſpiring it's vapours, with almoſt the ſame ſymptoms, that happen to animals deprived of the communication of the air by being ſhut up in the air pump *. This ſhows, that hydrogen gas may be united both with ſulphur and *carbone* at the ſame time, as this cavern contains *carbonic acid* as well as the other mineral waters, and thence ſo great an analogy is found between it's effects, and thoſe of the celebrated cavern called *Grotto del Cane*.

This *gas* is often produced in each of the organical kingdoms alſo; as many plants contain ſulphur, which appears under the form of ſulphuriſed *hydrogen gas*, when the water is decompoſed into it's conſtituent parts by their vital power †: beſides, ſome plants ſecern this *gas*, and hence the ungrateful, offenſive, and penetrating ſmell of garlic and onions is to be explained ‡.

Sulphuriſed *hydrogen gas* is equally obtained by the reſolution of animal parts. It is particularly evolved from the white of an egg, whence the ſtinking ſmell ariſing, when, in boiling eggs, a part of the water is decompoſed by means of the heat applied. From the ſame ſource the human *fæces* draw their ſmell; for it was even known to Van Hel-

* Seip *Beſchr. der Pyrmont mineral. Waſſer*, p. 90.

† Fourcroy, 1, 1. p. 836.

‡ *Girtanner*, 1, 1. capitel 35, p. 207.

mont

mont, that the air, evolved from the aliments by the action of the primæ viæ, is, in part, ſulphuriſed *hydrogen gas* * ; ſo that the *fæces* in the ſame animals ſtink more or leſs, according to their various aliments : the *fæces* of the cat kind, for inſtance, whatever be it's food, always exhale an extremely bad ſmell ; yet even in this tribe the ſmell will be more or leſs offenſive, according to the nature of the food. In fine, this *gas* ariſes in the putrefaction of the animal parts, though the air thus generated belongs only in a ſmall part to this variety.

SPECIES II.

Carbonated Hydrogen Gas.

HYDROGEN Gas combined with *carbonic acid* is found in many wells and caverns; but from their combination their noxious effects are not in the leaſt diminiſhed. Dr. Van Geuns relates a caſe of a well exhaling ſo offenſive, putrid, and penetrating a ſtench, that a labourer deſcending into it inſtantly loſt all ſenſe and motion, and when drawn out into the open air was ſeized with convulſions; at length coming to himſelf after three hours, his brain remained diſturbed during the whole night. Another leſs ſuddenly affected by the ſtink, was affected longer in his brain: both nevertheleſs recovered in a few days †. Though the doctor does not ſpeak of

* *Lib. de Flatibus*, § 49, p. 405.

† L. l. § 52, p. 61.

the nature of this exhalation, yet it ſeems to me, that it may be concluded from the circumſtances with ſufficient certainty, that the *carbonated hydrogen gas* was the cauſe of theſe ſymptoms. Beſides, ſome plants, when flouriſhing, ſecern this *gas*; for inſtance, it is commonly known, that the ſurrounding atmoſphere of the *dittany of Crete* takes fire, and burns vividly, if approached at night with a lighted candle: in fine, this *gas* is copiouſly evolved in the putrefaction both of animals and plants, and greatly contributes to the bad air of church-yards, and the evils produced by it.

SPECIES III.

Phoſphorated Hydrogen Gas.

The combination of *phoſphorus* with *hydrogen gas* is more ſeldom obſerved, than the former; ſince *phoſphorus* is found only in animal ſubſtances and a very few plants. Nay, this *gas* is ſcarcely any where met with, but in the ſpontaneous deſtruction of the animal body, by which this *gas*, ſurpaſſing all other modifications by it's extremely ſtinking ſmell, like that of rotten fiſh, is always produced. The putrid exhalations, which ariſe in church-yards, and in thoſe places, where many animals lie almoſt unburied, ought to be aſcribed in a great meaſure to it; yet, on the other hand, it is not to be denied, but that the horrible effects of the contagions, and

many

many other complaints, which do not unfrequently derive their origin from the exhalations occaſioned by the proceſs of putrefaction in the animal body, can be explained from this *gas* alone, as little as from the others; on the contrary, it is proved by recent obſervations, made principally by the french chemiſts, that in the decompoſition of animal matters there is evolved a ſingular, putrid, very penetrating, and intolerably ſtinking gas, which deſtroys the life of animals with the utmoſt violence *. The principles of this *gas* are hitherto not well known; the chemiſts, conſidering all that happens in the deſtruction of the animal body, ſuſpect only, that this gas is produced by the union of *phoſphorated, carbonated,* and perhaps alſo ſulphuriſed hydrogen gas.

SPECIES IV.

Hydrogen Gas combined with Azote and Carbonic Acid.

SOME years ago chemiſts already knew, chiefly from the experiments of the celebrated Dr. Prieſtley, that the air exhaling from ſtagnant waters, and marſhes, and which may be copiouſly collected from their muddy bottoms, in the form of bubbles, if the mud be only ſtirred with a ſtick, was *hydrogen gas.* Some chemiſts, however, ſince began to queſtion the truth

* *Annales* de *Chimie*, t. v, p. 173.

of it, as this *gas* burns with a celeſtial blue flame, and affords no detonation; till the celebrated Fourcroy proved, that this air is not pure *hydrogen gas*, but a product of it united with *azote* and *carbonic acid* in various proportions. What great injuries may be occaſioned by this *gas*, known by the ancients under the name of muddy air, ſufficiently appears from the works of the celebrated Lanciſi, in which, very dangerous epidemic fevers, at five ſeparate times, are recorded, that almoſt depopulated different cities of the papal dominions in a few years, and were all owing to the ſtagnant waters, corrupted by the ſummer heats *. But phyſicians greatly diſpute, whence the peſtilential quality, with which marſhes and ſtagnant waters are imbued, is derived. Lanciſi collected their various opinions before his time †: all thoſe phyſicians, though differing in the reſt, agree in this, that theſe noxious effects ought to be imputed not only to the muddy air, but to the other contagions produced by it; which opinion has hitherto prevailed. Though I had at firſt determined to follow this general opinion, having ſince accurately examined into the phenomena obſerved here, the fact ſeems to me to be quite different. For hiſtorians relate, that the regions now very unwholeſome, and abounding in marſhes and ſtagnant waters, were deemed very wholeſome a few centuries paſt: for inſtance, the *Campagna di Roma*, at preſent almoſt a ſolitude, and every where noted for it's inſalubrity, was formerly reckoned very ſalubrious, when it had

* *Opera omnia*, t. 1, *de Noxiis Paludum Effluviis, lib.* 2.

† L. l. *lib.* 1.

abundance

abundance of inhabitants exercising agriculture with the greatest industry under the dominion of the *romans*. The *Pontic* marshes, which now exhibit for the most part a desert, the pestilential vapours of which are spread to such a distance, that the neighbouring countries can scarcely be inhabited, but with danger of illness, were formerly covered with inhabitants, and afforded a climate not in the least noxious. Whence so great a change? certainly not from the climate; for the tuscans, dwelling almost under the same climate, possess a very wholesome region; therefore, it is but reasonable to conclude, that this insalubrity arises from the marshes, produced by the neglect of agriculture, and the want of trees and other plants. But if the unwholesomeness of the air depend upon the marshes alone, the above question may be determined by an accurate inquiry into the nature of their exhalation: it appeared to the celebrated Fourcroy, on submitting these vapours to a chemical examination, that they are an union of hydrogen gas with *azote* and *carbonic acid:* it follows then, that all the hurtful effects of the marshes and stagnant waters must be owing to this *gas* alone, as the other contagions, in reality never proved by any body, seem to be the products of mere imagination.

It is by no means difficult to refute the argument, with which the supporters of these chimerical contagions endeavour to prove their opinion, namely, that these noxious powers are not always observed, but chiefly in the summer, and then mostly by night: for though the marshes always exhale *hydrogen gas* united with *azote* and *carbonic acid*, the

proportion of *azote* and *carbonic acid* to *hydrogen* is found very different, according to various circumſtances. Now it is well known to the modern chemiſts, how different an action the ſame bodies, when united in different proportions, can exerciſe; of courſe it is more than probable, that theſe various effects ariſe in the ſummer from the altered proportion of the different kinds of gas by the increaſed temperature of the atmoſphere. And as to the reaſon why the effluvia principally exerciſe their noxious effects by night: Dr. Ingenhouſz * ingeniouſly explains it in the following way, that in the day time the noxious vapours are immediately carried to the upper parts of the atmoſphere, on account of the abounding caloric and the levity of the air, and thus are impeded from doing miſchief; on the contrary, by night they not only fail of being raiſed for want of ſufficient *caloric*, but thoſe which had been raiſed during the day, being condenſed by the cold, fall again upon the earth †.

* L. l. t. 1, 174 in a note.

† Some phyſicians may perhaps wonder at my not ſpeaking of the different manners of dying by theſe kinds of *gas:* but as I have already ſtated, that all theſe ſpecies of *gas* bring on death chiefly by ſuffocation, and knowing of no obſervations, which mention the ſymptoms of men killed by them, it was impoſſible to take particular notice of the manner of killing of each. As to the antidotes againſt theſe varieties of hydrogen gas, they are the ſame as have been ſpoken of when treating of azotic gas.

ORDER III.

Death from Gas mortal by a peculiar Stimulus.

SULPHUREOUS acid gas, nitrous gas, muriatic acid gas, oxygenated muriatic acid gas, carbonic acid gas, in ſhort, all the ſpecies of gas, which are acid or alcaline, belong to this order, as they all bring on death by affecting the lungs with a peculiar ſtimulus, and by altering the blood in this organ. This appears from the very different phenomena, obſerved in animals deſtroyed by theſe different ſpecies of gas: for inſtance, animals are immediately killed by the *oxygenated muriatic acid gas*, whereas they can ſtill protract life a few minutes in the other kinds of *gas*; which ſhows, that death happens ſooner or later, according to the various modes of ſtimulating of the *gas*.

Although this ſeems to be the main cauſe of death; we ought to conſider, that even the *oxygen* neceſſary for reſpiration is wanting. Let it not be argued, that the *oxygenated muriatic acid gas* is the moſt noxious of all:—for the *oxygen* abounding in this *gas* is not free, but chemically united with the *muriatic acid*, the effect of which union is, that the power of the *muriatic acid*, by which it operates both on organic and inorganic bodies, and which we call the power of ſtimulating when we ſpeak of organical bodies, is increaſed in every reſpect. Therefore this *gas*, violently ſtimulating even by itſelf; muſt inſtantly ſuffocate, and deſtroy life, on it's ſtimulus

being ſtill more augmented by the *oxygen*. I cannot avoid obſerving upon this occaſion, that the celebrated Fontana is miſtaken in aſſerting, that all theſe ſpecies of *gas* bring on death only by deſtroying the irritability *; as the contrary is clearly proved, both by the obſervations of the illuſtrious Tiſſot, from which it appears, that moſt of theſe kinds of *gas*, applied to the bowels, and even to muſcles, do not the leaſt injury †; and by the diſſections of ſuch bodies made by the celebrated Bergman, which evidently ſhow that the primary cauſe of death is in the lungs ‡. Therefore the extinction of the irritability, obſerved from the *carbonic acid gas*, and ſome others, is not to be conſidered as the cauſe of death, but as a ſecondary or accidental effect of the noxious ſtimulus of the *gas*.

As the purpoſe of this treatiſe prevents me from ſpeaking particularly of all theſe ſpecies of *gas*; I ſhall treat only of the *carbonic acid gas*; which ſpecies I chooſe in preference to the others; ſince man is moſt expoſed to it's vapours, as being more frequently met with than the others, and continually generated by the reſpiration of animals.

* *Traité ſur le Venin de la Vipère, ſur les Poiſons Américains, ſur la Laurier ceriſe, ſur quelques autres Poiſons végétaux*, t. i, pt. i, cap. 13, p. 74.

† *Traité des Nerfs*, etc. t. 1, pt. 2, art. ix, p. 20.

‡ *Macquers chemiſches Wörterbuch*, t. ii, p. 392, where the experiments made on this matter by the illuſtrious Bergman are recorded in a note by Dr. Leonhardi.

Carbonic

GENUS I.

Carbonic Acid Gas.

THIS *gas*, being heavier than the atmoſpherical air, always deſcends, when in a great quantity, and is found in many caverns under ground. It ſpeedily deſtroys the life of animals; which, being ſhut up in this *gas*, inſtantly ſeek to eſcape, and ſuffer the greateſt anxiety from the difficulty of breathing: their eyes protuberate; they fall down bereft of ſenſe and motion; are ſeized with a trembling and fainting; and, if not quickly drawn out, they die, as it were overcome with drowſineſs. On opening the body, the lungs are found a little collapſed, and inflamed in ſome places; the pulmonary artery, together with the right ventricle of the heart, the vena cava, and the veſſels of the brain are turgid; whereas the pulmonary veins, the left ventricle, and aorta, contain very little blood; the irritability of the muſcles is in moſt caſes totally extinguiſhed, ſo that the heart, cut out of the animal ſtill warm, cannot be rouſed to act by any ſtimulus *. The cavern between *Naples* and *Puteoli*, called by the italians *Grotta del Cane*, has long been celebrated among the caverns filled with this aerial acid; dogs and other animals let down into it, particularly to the bottom, are either immediately killed, or drawn out with a ſenſible impediment of the pulſe and reſpiration. Phyſicians formerly diſputed very warmly on the manner in which this vapour acts. Some, as Mead and Nollet, explained it's effects ſolely

* Macquer, l. l.

from

from the air's being noxious to reſpiration *; whereas others, as Van Geuns and Bruhier, defended a contrary opinion †, principally making uſe of this argument, that a total want of air is long ſuſtained by the indian divers, and during whole hours by the drowned, without cauſing death.—The very accurate obſerver of nature, Fontana, evidently proved ſome years ago, that it's vapour is nothing but *carbonic acid gas*. Thus it appears, that this gas brings on death not only by the want of *oxygen*, but alſo by it's peculiar ſtimulus: though the example of the indian divers ſeems to me to be of no weight; for theſe divers carefully ſtop the mouth and noſe, before they commit themſelves to the ſea; thus retaining the *oxygen* contained in the lungs, and being able to preſerve life ſome time without a renewal of freſh air.

As I treat here of death, from the *carbonic acid gas*, I cannot but take notice of the ſuffocating vapour of charcoal, which noxious and often mortal effect is chiefly owing to this *gas*: I ſay chiefly, ſince the *ſulphuriſed hydrogen gas* is not unfrequently evolved together with the *carbonic acid*, eſpecially from turf, of which the dutch make much uſe. And, perhaps, this *gas* enables us to explain why the effects of ſuch coals are the worſe, according as they contain more ſulphur; becauſe then the room is not only filled with vapours uſeleſs to reſpiration but the *oxygen* ſtill re-

* Mead *de Venenis*, p. 201, and *Phil. Tranſ. Vol.* 47, Art. x.

† Bruhier, l. l. t. ii, p. 95, and van Geuns, l. l. p. 63 and 64.

maining

maining in it is alſo attracted by the ſulphur melted by the fire.

Perſons ſuffocated by this vapour firſt experience a great head-ach, wearineſs, dimneſs of ſight, dizzineſs, and ſleepineſs; and at length an apoplectic fit acts in conjunction with the ſuffocating vapour to deſtroy life: which ſymptoms ſhow, that the effects of charcoal are analogous to thoſe of the *carbonic acid gas**.

The exhalations of lilies, violets, and other odoriferous flowers, ought likewiſe to be mentioned here. It was known long ago, that theſe kill in the ſame way; but their manner of acting remained undiſcovered till our own age, in which the celebrated Ingenhouſz has at length demonſtrated, that the exhalations of flowers are only *carbonic acid gas*, which is evolved by them in the day time, but more copiouſly at night. Hence the ſmell of flowers in rooms is obſerved principally after ſun-ſet, and their fatal effects then moſtly take place. There are many inſtances of a ſudden death occaſioned ſolely by a too great quantity of flowers, inconſiderately placed in a ſmall room. Dr. Ingenhouſz relates a caſe of a woman found dead in bed, the cauſe of whoſe death could be imputed to nothing but a too great quantity of lilies placed in her chamber †. The learned Triller mentions, that a girl ſeventeen years of age, enjoying excellent health, died of the too ſtrong ſmell of violets; and a

* The Drs. van Geuns, l. l. 57 and 58, and Unſer, *de Artz*, t. i, Art. 39, p. 286, relate many inſtances of men killed by ſuch vapours.

† L. l. t. i, lib. i, p. 69, art. xv, & *lib.* ii, art. ii.

ſimilar caſe happened at *London*, in the year 1764, when the lives of the women were however ſaved *.

It ſerves greatly to confirm what I have above ſaid of a peculiar ſtimulus, that this *gas*, ſo noxious when inſpired, may yet be taken in with beer, mineral waters, and with almoſt all the aliments, every day, in a large quantity, without the leaſt detriment. The antidotes counteracting the noxious effects of this gas are the bringing of the patient into the atmoſpherical air; the application of cauſtic volatile alkali to the noſe; and the rubbing of the body with ſpirit of lavender, and ſimilar ſpirituous remedies.

As thus the *carbonic acid gas* is continually generated by the reſpiration of animals, by the combuſtion of *carbone*, and by the putrefaction of organic bodies, while on the other hand the *oxygen gas* is attracted from the atmoſphere, the air would in a ſhort time become wholly uſeleſs for reſpiration, if nature had not provided means, by which the atmoſphere could be again purified from the abounding *carbonic gas*. Theſe means are the plants, by the vegetation of which the *carbonic acid gas* is attracted out of the atmoſphere, and reſolved into it's conſtituent parts; the *carbone* paſſes into the ſubſtance of the plants; the *oxygen*, on the contrary, is exhaled like an excrement in the form of *gas*. Nay the plants do not only purify the air in this manner; but they alſo attract water, both from the atmoſphere and the earth, and decompoſe it: the *hydrogen* of this water concurs with the *carbone* in forming the oils

* Triller's *opuſcula medico-philologica*, vol. i, diſſ. non. p. 237.

and

and reſins of the plants, while the *oxygen* of this alſo flies off in the form of air.

This is further demonſtrated by what follows.

1. Plants in the higheſt degree poiſonous ſecern pure *oxygen gas* as well as others*.

2. The moſt common plants, as, for inſtance, the whole tribe of graſſes, and all others, which riſe ſpontaneouſly on the ſurface of the earth, afford the largeſt quantity of *oxygen gas* †.

3. The above plants are ſuch as are vigorous till the end of autumn, and the vegetation of which is incited the ſooneſt in the beginning of ſpring; thus they are capable of performing their deſtined functions almoſt during the whole year.

4. The vegetation of plants greatly increaſes in the ſummer, when putrid and mephitic exhalations infect the atmoſpherical air in a greater quantity, on account of the increaſed temperature. Now the effect of this augmented vegetation muſt be, that the plants exhale a greater quantity of *oxygen gas*, and conſequently almoſt the ſame quantity of it is contained in the atmoſphere during each of the ſeaſons.

5. The vegetation of plants growing in the countries under the torrid zone, where the air is much

* Ingenhouſz, l. l. vol. ii, art. 31, p. 191 and 192.

† Senebier *Mémoires phyſico-chimiques, t. i,* §§ 41.

ſooner

ſooner corrupted by poiſonous effluvia, attains the higheſt degree of perfection, ſo that the plants of ſuch countries do not only attract *carbonic acid gas*, with great eagerneſs, but alſo ſecern ſuch an abundance of pure oxygen *gas*, that the ſmall quantity afforded by the plants growing in the temperate zone can by no means be compared with it. If we attend to theſe ſubjects, how wiſely do we find that all is ordained! For not only do the plants contribute to the ſupport of the animal economy by attracting *carbonic acid gas*; but, moreover, what proves fatal to the animal body is abſolutely requiſite to the vegetation of plants; and, according to the proportion in which the *carbonic acid gas* is exhaled from the one organical kingdom, it is more or leſs eagerly taken in by the other; and thus the diſturbance of the equilibrium of the various ſpecies of gas, of which the atmoſphere is compoſed, is effectually prevented*.

* All this confirms the opinion, that the want of agriculture muſt greatly contribute to render a climate unwholeſome.

CLASS VI.

Death from Poisons.

BY poiſon I underſtand, with the illuſtrious Gaubius, whatever, in a very ſmall quantity, either internally taken or externally applied, exerts effects tending to deſtroy animal life*. This definition of Gaubius, though rather a deſcription of an effect common to all poiſons, than a definition of them, ſeems to me to be the beſt hitherto made; both becauſe the definitions of other authors are leſs accurate, and that I every day become more and more convinced, that it is impoſſible to lay down a general definition of poiſons. For not to mention, that all poiſons are moſtly relative, ſo that ſome, which are very noxious with reſpect to the human body, ſerve other animals for nouriſhment: as, for inſtance, mules and goats eat the white hellebore, and quails feed upon the ſeeds of the *lolium temulentum*, without any injury†; no abſolute doſe can be determined even with regard to the human body, to which, and no farther we may proceed; ſince the medicinal and poiſonous properties are converted one into the other by a little variation of the quantity, ſo that the ſame doſe, which recovers one from

* *Inſt. Pathol.* § 486.

† Gmelin's *Allgemeine Geſchichte der Pflanzengifte*, ord. i, art. i, p. 426 and 432, and Plenck's *Toxologia* p. 10.

a very

a very obſtinate diſeaſe, extinguiſhes life in another; an evident proof, that no accurate meaſure of the quantity, in which poiſons are injurious, can be laid down, but that the doſe muſt be different in various individuals, according to their different conſtitutions. But if poiſons be hurtful to the body, into which they are received, according to their quantity alone, perhaps all poiſons, when taken in a proper doſe, would have ſalutary effects: and, on the contrary, all remedies might be called poiſons in a certain ſenſe; for all medicines, when adminiſtered in too large a doſe, prove noxious. I know, indeed, that there are ſubſtances, which, in whatever doſe they may be given, almoſt always injure: but I know likewiſe, that modern phyſicians have exhibited ſome of them with ſucceſs, which leads me to expect, that the reſt may one time or other be alſo converted to the uſe of mankind.

Be this as it may, it ſuffices to have ſhown, what ſubſtances are named poiſonous by us. As ſuch are found in all the three kingdoms, I ſhall divide this claſs into three orders: in the firſt of which I ſhall treat of the poiſons of the animal kingdom, leaving thoſe of the vegetable kingdom for the ſecond; I ſhall ſpeak of the mineral poiſons in the third; and a poiſon, the nature of which is hitherto not well known, ſhall form the ſupplement to this claſs.

ORDER

ORDER I.

The Poiſons of the animal Kingdom.

THESE poiſons may be reduced to two kinds, according to their difference of operating; the one of which contains the poiſons, which bring on death principally when communicated to the body by a wound; the other, ſuch as chiefly exerciſe their noxious power, when taken internally.

GENUS I.

Poiſons bringing on Death principally by Means of a Wound.

SPECIES I.

The Viper.

PHYSICIANS did not agree reſpecting the nature of the poiſon of vipers, till within a few years, when the ab. Fontana publiſhed his work, containing, among other objects, many experiments on this poiſon; by which it appears, that it is a viſcid ſubſtance, like the mucilage of gum, and that this humour, ſecerned by peculiar organs under the root of the canine teeth, is poured into the wound during the bite of the viper *. This poiſon, according to the numerous obſervations of Fontana; does not hurt every ſpecies of animals, as the other ſer-

* L. l. t, i, cap. ii, p. 10.

pents, tortoiſes, and polypes are not affected by it; but it proves mortal to man, and many other animals. Received on the tongue, it does not inflame, but impreſſes on it the ſenſation of an aſtringent ſubſtance during ſome hours; if ſwallowed, it injures only when taken in a large doſe; it may be externally applied to the ſkin, cellular membrane, tendons, and even to the nerves, without occaſioning death; but when communicated by a wound, it kills even in a ſmall doſe. The ſymptoms of this poiſon are the following: pain of the afflicted part; an extenſive inflammatory ſwelling ariſing from the humours carried to it by the vital powers, to obtund the ſenſe of the poiſonous ſtimulus, whence an extravaſation of black blood, and a livid colour of the bitten part, are always obſerved; afterwards ſhivering, paleneſs, anxiety at the præcordia, a weak, unequal, intermitting pulſe, palpitation of the heart, faintings, cold ſweats, convulſions, and drowſineſs enſue, ſoon terminating in death, if help be not quickly afforded.

The time requiſite to the noxious effects of this poiſon is different, according to the various ſpecies of vipers, and to the different conſtitutions of the animals bitten; yet theſe effects univerſally manifeſted themſelves in the animals, on which Fontana made his experiments, within a few minutes; but if the part injured were immediately amputated, the animals remained free from all theſe ſymptoms*; which ſhows, that the whole body is not inſtantly affected, but that a certain time is re-

* Fontana l. l. *tom.* 1, pt. 3, cap. 2.

quired

quired for communicating the topical disorder to the other parts of the body.

But how is this poison communicated to the body? By the lymphatic system. This seems to the ab. Fontana improbable, as it may be applied without the least danger to the nerves, skin, tendons, and muscles; all of which are furnished with lymphatic vessels *; and if the trunks of the absorbent system be tied, it exercises, though slowly, it's noxious power †. Neither does it operate by means of the nerves; for the poison, when directly applied to them, does not produce the least effect, and kills as certainly as before, when the nerves are tied or cut ‡. Perhaps the communication may then be performed by the blood vessels? By no means: for the poison brings on death, when the circulation is previously impeded, or the blood vessels of the bitten part are cut, so that the communication between the vessels of the affected part and the rest of the body is completely interrupted; the effects of the poison are only retarded by this operation §.

But if this poison operate neither through the medium of the lymphatic system, the blood, nor the nerves, what can be it's manner of acting, and the cause of death?

Fontana, on finding the blood always coagulated in the animals killed by this poison, conceived the opinion, that it acts directly on the blood, and coa-

* Fontana, l. l. p. 145.
† Fontana, l. l. p. 303.
‡ Fontana, l. l. p. 268.
§ Fontana, l. l. p. 299.

gulates it; and that the effect of this coagulation is the abolition of irritability, by extinguiſhing which death inſtantly enſues*.

With the greateſt deference to the talents of Fontana, I cannot coincide with this opinion, and even his own experiments diſſuade me from agreeing with him: for though the blood is always found coagulated in the veſſels, nevertheleſs, drawn out of the vein of a living animal, and mixed with this poiſon, it does not coagulate: on the contrary, the coagulation of the blood is prevented by it's mixture with this poiſon †; which clearly proves, that the coagulation of the blood ought to be derived not from the immediate contact of the poiſon, but from the peculiar action of the ſolid parts on the fluids: for the ſolids, being incited to inordinate motions by the poiſonous ſtimulus, act on the fluids in an unuſual way, by which ſuch an alteration is produced in the blood, that it's red colour is converted into black, which explanation is beſides confirmed by all the ſymptoms of the poiſon.

As to the manner of acting of this poiſon, notwithſtanding the arguments of Fontana, it ſeems to me highly probable, that this poiſon is attracted by the abſorbent veſſels, and by them communicated to the blood: for this poiſon at firſt acts topically, and afterwards produces a general affection of the ſyſtem: but there exiſts no medium of communication, except the lymphatics, the nerves, the blood-veſſels, and the cellular membrane; and Fontana

* Fontana, l. l. p. 318, and the following.

† Fontana, l. l. p. 305.

has

has proved, that it does not act by means of the cellular membrane, the blood veſſels, or the nerves; whence it neceſſarily follows, that the poiſon is communicated to the ſyſtem by the lymphatics. This opinion is alſo favoured by the analogy between the poiſon of vipers and other poiſons, as thoſe of a mad dog, the ſmall pox, &c., which are doubtleſs communicated to the animal body by means of the abſorbent veſſels: beſides, the experiments of Fontana do not prove to the contrary: he tied all the lymphatic veſſels that he could find, and yet death followed, though more ſlowly. But if we conſider the great number of abſorbent veſſels, which exiſt in all the parts of the human body, and that their orifices conceal themſelves from the eye even when aſſiſted by glaſſes, it ſeems to be very difficult to put a ſtop to all communications between ſuch ſmall organs and the other parts of the body with a ligature; not to ſpeak of thoſe abſorbent veſſels, which lie ſo deep, as to bid defiance to all our ſkill in tying. Beſides, Fontana ſeems to have been miſtaken in making theſe trials; for the celebrated profeſſor Soemmering aſſerts, that, from his experiments, this poiſon appears to operate by the lymphatics *. The other argument, namely, that this poiſon may with ſafety be applied to the ſkin, cellular membrane, tendons, nerves, and even to muſcles, if it really be true, proves at beſt nothing more, than that the abſorbent veſſels of theſe parts are not able to ſuck in the poiſon, and, by no means, that it is not propagated by abſorption: for it ſeems highly probable, that the ſtructure of the abſorbent veſſels varies in different parts of the body. It follows then, that

* De Morb. Vaſor. abſorb.

the abſorbent veſſels of one part may be able to take up a liquid, which thoſe of another part are altogether unfit to imbibe: in fine, as the orifices of the abſorbent veſſels are provided with a faculty of rejecting noxious matters, and only abſorbing ſuch as are beneficial; for a poiſon to be taken up by the orifices of the abſorbent veſſels, it is requiſite, that an affinity be firſt generated between it and the lymphatic ſyſtem; but after the radiated extremities of the lymphatics are deſtroyed by a wound, their trunks appear to abſorb better than the original orifices, of which we have a ſtriking inſtance in the abſorption of the venereal poiſon: "venereal "matter, having produced an ulcer, is almoſt im- "mediately abſorbed; whereas, had the matter "been applied to the original orifices, it might "either not have been abſorbed at all, or not till "after a conſiderable period*." The manner of dying from this poiſon is, I believe, to be explained in the following way. The poiſon, being communicated to the blood by the abſorbent veſſels, violently operates on the ſanguineous ſyſtem; the veſſels affected react on the blood, and deſtroy it's craſis; the altered blood, *vice verſa*, acts upon the ſolids, which are thus incited to action with the utmoſt violence; but, unable to ſuſtain ſuch a ſhock, they cannot well perform their functions, and ſoon languiſh: hence enſue palpitation of the heart, a fainting fit, and the ſymptoms of an approaching apoplexy, from the retention of the blood in the brain; theſe phenomena continue, till at length, the organical ſtructure being entirely deſtroyed by the continually irritating ſtimulus, death puts an end to them.

* W. Cruikſhank's Anatomy of the abſorbent Veſſels, p. 114.

As

As to what belongs to the coagulation of the blood, in my humble opinion it ſhould not be deemed an eſſential character of this poiſon, but merely accidental, as in death from many other diſeaſes; and the more, as, on the contrary, the blood is found diſſolved in thoſe bitten by american vipers, at leaſt by ſome: for theſe ſpecies of vipers agree with the others in almoſt their whole economy: therefore all, that I have ſaid of the former, *mutatis mutandis*, is alſo true of the latter. The poiſon of the *american* vipers however proves fatal in a much ſmaller quantity, and often kills in leſs than five minutes, to which quick extinction of univerſal life this diſſolution of the blood ſeems to be owing. As to the antidotes againſt the poiſon of the viper, the bitten part, when practicable, is to be removed either by exciſion, or cautery, and afterwards the wound is to be well waſhed with a ſlight ſolution of the *lapis cauſticus*, in order to prevent the poiſon from being abſorbed. Inwardly, ſaccharum, oleum olivarum, radix ſerpentariæ virginianæ, radix belladonnæ, milk, and ammonia preparata, are to be given; which medicines, eſpecially the ammonia, have ſometimes proved uſeful, though, to ſay the truth, a ſpecific againſt this poiſon is hitherto unknown. All this is to be underſtood of the vipers in hot climates; for the bite of theſe animals in cold and temperate countries does not occaſion ſo much miſchief, and of courſe the removing of the bitten part is not neceſſary.

SPECIES II.

The Insect called Furia infernalis.

This insect, nearly two lines in length and met with in the northern regions, principally from the summer till the winter solstice, inserts itself into the uncovered parts both of men and cattle, leaving behind it a small, dark, often black, and extremely painful spot. If the whole insect be not extracted, this spot quickly spreads like a sphacelus, occasions acute fever, and destroys life with the most excruciating pains in the course of a few days, and often even in a few hours *.

The cause of death ought to be explained from the poisonous stimulus, which, violently affecting the body, brings on an inflammatory fever, that, like the spurious inflammation, in a short time inducing a dissolution of the powers, kills by the extinction of the vital principle; or, to speak more clearly, the patient is carried off by the too great violence of the stimulus.

SPECIES III.

The Bite of mad Animals.

Of these I shall only treat of the bite of a mad dog, both because the madness of this animal, at least in temperate climates, is of more common occurrence, and the bites of the other animals, as

* Callisen *Principia Systematis Chirurgiæ hodiernæ*, t. 1, pt. ii, ord. 3, cap. i, §§ 1009, p. 510.

to

to their effects, moſtly agree with that of a mad dog.

The following phenomena are ſooner or later obſerved in perſons bitten by a mad dog, according to their various conſtitutions; a painful ſenſation of the affected part, wearineſs and heavineſs, ſlight unrefreſhing ſleep, the patients afterwards become gloomy, ſad, penſive, anxious and paſſionate; they ſeek for retirement, the appetite is diminiſhed, the ſwallowing of liquids grows difficult; they are afraid of water, if they attempt to drink they are violently convulſed, and they are frightened even at the ſight of a fluid*; ſometimes they vomit black bile, and a deſire of biting is obſerved in them; the body is in a continual agitation, a priapiſm, and hoarſeneſs come on; at intervals they labour under the moſt dreadful convulſions; at length cold ſweats, palſy, and a relaxation of all the powers, ſucceed as forerunners of approaching diſſolution.

Theſe are the uſual ſymptoms of this horrible complaint, from which alone we can attempt to explain it's nature, as the diſſection of ſuch bodies throw no light upon the ſubject. On conſidering them, it ſeems to me, that the manner of acting of this poiſon may be explained in the following manner; viz. The poiſonous ſaliva of the dog, poured into the wound, is applied to the abſorbent veſſels; theſe nevertheleſs do not abſorb this acrid matter, becauſe their orifices poſſeſs a faculty of taking up only ſuitable matters; thus the poiſon remaining applied

* I have ſeen two inſtances, in which the patient could eaſily take every thing that was ſolid; whereas attempting to ſwallow any fluid he became immediately ſeized with ſtrong convulſions.

to

to the lymphatic veſſels, and continually ſtimulating them, the effect of this ſharp ſtimulus can be nothing leſs than the progreſſive alteration of the compoſition of the ſtimulated part. Now, as the change of compoſition in every organ, is always in the compound ratio of the ſtructure and the ſtimulus applied, an affinity muſt neceſſarily ariſe between the ſtimulating poiſon and the degenerated abſorbent part, which being effected, every poiſon is attracted by the lymphatic ſyſtem*. Thus as long as the requiſite degeneration of the abſorbent part does not take place, ſo long the poiſon lies without effect, and no marks of illneſs appear, which inſtantly manifeſt themſelves, when the neceſſary affinity is brought about; for as ſoon as the poiſon of a mad dog is abſorbed, pain, tumefaction, and itching of the affected part, wearineſs and melancholy are obſerved; this is the firſt ſtage of the diſeaſe, which paſſes on to the ſecond, when the poiſon enters the blood: and indeed the whole maſs of blood being infected, the difficult ſwallowing of liquids and the hydrophobia are directly obſerved; in a word all the other ſymptoms then ariſe.

The phenomena produced by this poiſon not only agree with this opinion, but analogy greatly favours it; as other poiſons, ſuch as the ſmall pox and meaſles, which are doubtleſs abſorbed, exhibit analogous ſymptoms at the time of their abſorption. For inſtance, let the poiſon of the ſmall pox be communicated to a child by inoculation, the wound will ſoon be healed, and the child will ſeem to be as

* See my diſſertation *de Cauſa Abſorptionis*, cap. ii, § 10, where I particularly treat of this matter.

well

well as before: an itching, tumour, and pain of the afflicted part, together with the swelling of the axillary glands, will however arise within a few days, if the inoculation succeed well; the child will likewise complain of wearineſs, and heavineſs, which, according to the opinion of all phyſicians, are ſo many tokens, that the matter is abſorbed. But if all phyſicians agree, that theſe phenomena ſignify the abſorption of the poiſon in caſes of the ſmall pox, why ſhould not analogous ſymptoms denote, that the ſame thing takes place in the poiſon of a mad dog? In fine, there are obſervations which directly prove, that the poiſon of a mad dog is communicated to the ſanguineous ſyſtem by the abſorbent veſſels. For Hunter and Cruikſhank have obſerved ſwelling, pain, and inflammation of the glands of the axilla, and of thoſe of the groin, and ſtreaks going up from the wound to thoſe glands after the bite of a mad dog; and Tode has demonſtrated, by a remarkable example, that this poiſon, though only applied to the ſkin without the leaſt wound, may yet ſometimes be abſorbed, and bring on death *.

Notwithſtanding, Richter, and many other eminent phyſicians, are of a contrary opinion: and, though they agree, that at length this poiſon affects the ſanguineous ſyſtem, they nevertheleſs contend, that all the ſymptoms of the firſt ſtage of the diſeaſe ſhould be imputed wholly to the ſympathy of the nerves †. But, with ſubmiſſion to theſe illuſtrious

* Soemmering *de Morbis Vaſorum abſorbentium*, p. 65 and 66.

† Richter, l. l. t. i, *capitel* 15, § 417, Calliſen, l. l. § 1020, p. 515. R. Vogel, *Prælect. acad.* p. 751, and *Plenck*, l. l. p. 68, in a note.

phyſicians,

phyſicians, if their opinion be founded on the obſervation of nature, why does not an extirpation of the injured part, in the firſt ſtage of the diſeaſe, cure? If the diſeaſe in the firſt ſtage be ſtill topical, and all the ſymptoms ſhould be derived only from the ſympathy of the nerves, why does the diſorder perform it's courſe and terminate in the uſual way by death, though the bitten part be cut out? Let it not be argued, that the efficacy of nervous remedies in theſe caſes ſupports this opinion: from this no argument can be drawn, for nothing is more certain, than that many medicines, called nervous, do not directly affect the nervous ſyſtem. When ſpeaking of the vegetable poiſons I ſhall demonſtrate this with regard to *opium*, and I could eaſily prove the ſame of many others, were it not foreign to the deſign of this treatiſe. The manner of dying in this diſeaſe ought to be explained in the following way. The wretched patient is agitated with the ſtrongeſt convulſions, which are ſucceeded by a torpor of the vital powers, from which ſource the lucid intervals of this diſtemper are to be derived; yet the poiſonous ſtimulus continually operates on the ſolids, repeatedly producing convulſions, by rouſing them into action, and ſo the vital principle ſtruggles for ſome time againſt the noxious power: but as the organs are not long able to ſuſtain ſuch attacks; and the leſs, as their energy is not reſtored by nutritious ſubſtances, at length an univerſal relaxation of the ſyſtem ſucceeds to the convulſions, a cold ſweat and palſy enſue, which ſoon terminate in death. A remedy counteracting this dreadful poiſon has long been deſired. Mercury and opium in large quantities, muſk, and camphor,

though

though perhaps they have afforded relief in ſome caſes, generally prove inefficacious. Some years ago, however, profeſſor Richmon, of Bonn, publiſhed a work on the treatment of hydrophobia, in which he has proved, by a great number of obſervations, that the root of the deadly nightſhade not only always prevents the diſeaſe from coming on, when uſed before the ſymptoms takes place, but that, even in many caſes, in which the patients are already ſeized with the hydrophobia, the malady is removed by uſing this medicine, though this author does not deny, that the diſeaſe, when it has continued ſome time, often proves fatal*.

Before I paſs on to the other genus of this order, I muſt ſtate a queſtion, whether the fatal effects of this poiſon, like that of the viper, take place almoſt ſolely through the means of a wound. Indeed the affirmative is not only favoured by analogy, but alſo by a ſingular caſe, related by the learned van der Haar; viz. that a man enjoyed his wife only one hour before ſhe was ſeized with a hydrophobia, without being in the leaſt injured in his health; beſides van der Haar aſſerts, that the poiſon of a mad dog is only deadly by a wound, and that the ſaliva of a mad perſon may be ſwallowed without danger†: however, as many authors have obſerved the contrary, and as even the poiſon of vipers, ſwallowed in a greater quantity, as, for inſtance, as far as thirty drops, ſuddenly kills‡; and the doſe which may be taken with ſafety cannot

* *Handelingen von het Utrecht. Genoodſchap der Weetenſchappen*, 8 *deel.*

† *Chirurgiſche en mediſchen Waarneemingen, Waarneeming* 137.

‡ Fontana, l. l. t. ii, in SUPPLEMENTO, p. 307.

be

be exactly determined; it seems to me, that the swallowing of the saliva of hydrophobic patients is attended with danger.

GENUS II.

Poisons bringing on Death, principally when swallowed.

SPECIES I.

Cantharides.

THE powder of these insects, when taken in some quantity, excites thirst, a taste of pitch, nausea, vomiting, the most violent pains in the stomach, præcordia, and hypochondria, especially on the right side, inflammation of the primæ viæ, priapism, strangury, a stoppage of the urine, bloody urine, often a bloody flux, sphacelus of the stomach and bowels, and death.

With respect to the manner of acting of this poison, and it's way of causing death, Dr. Forsten thinks, that this poison enters the blood, and is conveyed with it to all the parts of the body; besides, he is of opinion, that cantharides dissolve the blood, and lessen it's cohesion: because this phenomenon is observed when their powder is mixed with blood out of the body *.

This opinion, however, seems to me, to be attended with some difficulties. In the first place, can it be believed, that, if in reality the acrid poison of cantharides had infected the whole mass of blood, ne-

* *Act. servandis Civib.* t. 1, p. 266.

vertheleſs almoſt all patients would be reſtored to health by proper remedies, though the diſeaſe had already manifeſted itſelf, as the caſes related in the doctor's diſſertation prove *? Is it not much more probable, from the elective power which the *orifices* of the abſorbent veſſels enjoy, that this poiſon does not enter the ſanguineous ſyſtem?

2dly, A woman, who had vomited up almoſt all the poiſon a ſhort time after ſhe had ſwallowed it, by making uſe of an emetic, had, notwithſtanding, bloody urine and the other ſymptoms, with the uſual violence: which ſhows, that this poiſon acts chiefly on the nerves, impreſſes on them the morbid character, and therefore the inordinate action of the nerves does not ceaſe, though the poiſonous ſtimulus be removed, but continues till this morbid character impreſſed on the nerves is aboliſhed.

3dly, Thoſe phenomena, which take place when cantharides are mixed with the blood out of the body, prove nothing with reſpect to their action in the living body: as it appears, from what is above ſhown with regard to the poiſon of vipers, that ſuch experiments in a living body often produce quite contrary effects.

Therefore it ſeems more reaſonable to conclude, that the poiſon of cantharides never enters the blood, but only operates on the primæ viæ. Thus the death occaſioned by it ſhould be attributed to ſphacelus of the ſtomach and bowels, which ſucceeds their inflammation; and the diſorders of the

* L. l. p. 272.

urinary

urinary ſyſtem are to be explained from the ſympathy exiſting between the primæ viæ and the urinary organs. The antidotes againſt this poiſon are an emetic and a gentle purgative, in order to expel this noxious ſubſtance from the body; afterwards milk, ſaleb, and an emulſion of gum arabic, in conjunction with camphor, complete the cure.

The may-bug and *proſcarabeus* agree with cantharides both in manner of acting and cauſe of death: at leaſt authors relate, that death may be brought on by their uſe *. Yet their noxious power ſeems to act leſs violently; ſince Dr. Oſiander has proved, by an inſtance of a woman, who was filled up with a quantity of different inſects, that they may remain for a long time alive and vigorous in the human body without cauſing death †.

ORDER II.

Vegetable Poiſons.

THE poiſons of the vegetable kingdom are reduced by Dr. Plenck to three kinds; viz. narcotics, acrid narcotics, and acrids; which diviſion I ſhall employ, as moſt agreeable to the phenomena of nature. The deſign of this work prevents me from treating of all the poiſonous plants; I ſhall ſelect

* Plenck, l. l. p. 43.

† *Gedenkwurdigkeiten fur die Heilkunde, und Geburtſhulfe*, t. 1, art. 1.

therefore

therefore only two plants of each kind; and having mentioned the phenomena which they commonly occaſion, I ſhall add their manner of acting, and the cauſe of the death they produce, as far as is in my power; although it is not to be denied, but that the manner of acting of many poiſonous plants is wrapped up in obſcurity.

GENUS I.

Narcotic Poiſons.

SPECIES I.

Opium.

AUTHORS have long diſputed on the action of opium in the human body, without it's being decided, to which of them the palm is due. As the experiments of ſome are oppoſite to the obſervations of others, it ſeems to me eligible, to paſs them all over, and proceed directly to the phenomena obſerved both from a ſmall, and a large doſe of *opium*; and having accurately inquired into theſe, to conſider how far they may ſerve to explain the manner of acting of opium, and the cauſe of death from it's abuſe. Opium, taken in a ſmall doſe, by it's ſtupifying power renders the mind calm and cheerful, and diſpels all fear; hence the eaſtern nations have the cuſtom of taking opium to acquire audacity, and to exhilarate the mind: it farther incites

the action of the ſanguineous ſyſtem, and greatly accelerates the circulation: it acts with no leſs power on the genital parts; for it ſtimulates them with ſuch vehemence, that even old men, otherwiſe ſtrangers to venereal pleaſures, are not callous to it's power, and the erection of the penis remains even after death in thoſe turkiſh ſoldiers ſlain in battle, who have previouſly ſwallowed opium *: in fine it increaſes perſpiration, accompanied with itching of the ſkin; ſuppreſſing on the contrary all the other excretions. The grateful ſenſation excited by opium, however, does not long continue, for it ceaſes within four or five hours; a torpor, and ſleepineſs ſucceed, which often remain during a long time †.

But if opium be taken in a large doſe, theſe grateful ſenſations do not appear; on the contrary, it then ſtupifies the nerves, and enfeebles their powers ſo much, that inſtances are not unfrequent of the feeling, ſight, hearing, and the other ſenſes being thereby taken away: hence ſtupor, dizzineſs, ſleepineſs, inſenſibility to all external impreſſions, and a ſtoic behaviour even under the moſt cruel torments. A great doſe alſo renders men incapable of coitus, and equally deſtroys the irritability of the muſcular parts, as the languor of the ſtomach and bowels, the great diminution of their periſtaltic motion, and the immobility of the knees clearly ſhow: yet a ſubſtance ſo noxious both to the muſcular and nervous power proves a potent ſtimulus to the ſanguine-

* Murray *Apparat. Medicam.* t. ii, p. 282.

† Gmelin, l. l, p. 470.

ous

ous ſyſtem, and extremely augments the frequency of the pulſe, together with the heat of the body; ſo that the breathing becomes quicker and more difficult, the blood veſſels grow turgid, a redneſs and ſwelling of the face ariſe, a heavineſs in the head, and an accumulation of blood in the brain enſue; and theſe phenomena are ſometimes attended with delirium and phrenſy, and a *ſnoring* reſpiration: at length a mortal apoplexy is produced, either from the brain being oppreſſed by too great a quantity of blood, or from an effuſion of the blood occaſioned by a rupture of the veſſels.

From theſe phenomena, which are always obſerved in perſons killed by opium, the following inferences may be drawn:

1. That the opinion of Dr. Alſton *, according to which opium leſſens the power of the ſanguineous ſyſtem, is refuted by daily experience; and that no concluſion can be drawn, with regard to mankind, from experiments on animals, which trembled under the anatomical knife, and had already ſuffered ſuch great torments.

2. That the opinion of Dr. Whytt †, according to which the opium exerts it's power only on the nerves of the ſtomach, is not founded on the obſervation of nature: for it does not act before it is at leaſt partly abſorbed and has entered into the blood; as is proved, not only by the manner of acting of opium, which

* *Medical Eſſays and Obſervations*, t. v, part i, art. x, p. 112.

† Whytt's *Works*, p. 307 and the following.

does not kill till after ſome time, but alſo by the ſweat not unfrequently ſmelling of opium *.

3. As opium affords a ſtimulus, which, while it acts on the brain and muſcles with a narcotic power, at the ſame time incites the functions of the ſanguineous ſyſtem; it's action demonſtrates, both that the function of the ſanguineous ſyſtem does not depend upon the nervous power, and that the ſame ſtimulus does not always affect all the irritable parts in the ſame manner; but, on the contrary, often produces in them oppoſite effects, according to the different mode of union.

4. Though no doubt opium operates on the brain, yet it by no means follows, that this poiſon directly affects the nerves; on the contrary, the celebrated Fontana has proved, by a great number of experiments, that opium, when applied to the bare nerves, does not produce the leaſt effect †, from which it appears, that the nerves are attacked not primarily, but only ſecondarily by opium.

5. As thus, ſtrictly ſpeaking, the nervous ſyſtem is not affected by opium; but the brain, when injured by the taking of opium, alſo affects the nerves themſelves by ſympathy; it follows, both that the nerves poſſeſs their peculiar powers, which are quite different from the energy of the brain; and that the brain itſelf may ſometimes be affected by means of other parts, as well as by the nerves: therefore the

* Murray, l. l, p. 284.

† T. ii, Supplement, p. 355.

nerves

nerves are far from being primarily affected in all the diſeaſes called nervous.

6. As, though, according to modern anatomiſts, the internal coat of the blood veſſels is entirely deſtitute of nerves, yet convulſions ariſe from an injection of opium into the veins *; and as the ſame phenomena take place, when the nerves of that part, in which the experiment is made, are cut, either at their origin, or in their courſe †; it follows, that convulſions do not always conſtitute a proof of the nervous ſyſtem's being affected; but are ſometimes owing either to a diſturbance of the equilibrium between the antagoniſt muſcles, or to the inordinate action of the ſanguineous ſyſtem.

The noxious effects of this poiſon are to be prevented by an emetic, which removes the poiſon when ſtill remaining in the ſtomach, and, by ſhaking the whole ſyſtem, diminiſhes the propenſity to ſleep; by keeping the patient from ſleeping by continual exerciſe, by making a great noiſe, and by forcing him to walk about; and by drinking large draughts of coffee, mixed with lemon juice.

As to the cauſe of death from opium, it appears from the ſymptoms occaſioned by this poiſon, that opium vehemently excites the circulation; the veſſels thence become turgid, and, though their action is ſtill excited by ſuch a doſe of opium as diminiſhes

* Fontana, l. l, t. ii, p. 361.

† Monro's *Eſſays and Obſervat. phyſ. and liter.* t. iii, art. xiii, exp. 14, p. 334.

the irritability of the other parts, nevertheleſs at length the veſſels themſelves, growing languid from the violent ſtimulus, do not duly perform their functions; the blood veſſels of the brain being more delicate than the others, they yield ſooner; the brain grows thus oppreſſed by the blood; and an apoplectic fit puts an end to life.

SPECIES II.

Leaves of the Cherry-Bay, Lauro-Ceraſus.

THE water diſtilled from the leaves of the lauroceraſus is converted into a very ſtrong poiſon by cohobation. When ſwallowed, or injected into the anus, in a ſmall doſe, convulſions either ſtronger or weaker ariſe; the animal is afflicted with a palſy, principally of the hind feet: it's organs of ſenſe remain nevertheleſs but little injured; for it perceives objects by hearing and ſight, and moves the limbs on being pricked or pinched. In a large doſe it kills in a very ſhort time, and without convulſions; and this poiſon then operates ſo quickly, that before it reaches the ſtomach, the animal already experiences it's deadly effects. It kills animals of cold blood ſtill ſooner than thoſe of hot blood. The poiſon communicated by a wound is noxious; but then a much greater quantity is requiſite: injected into the veins, it immediately deſtroys life: applied directly to the nerves, it affects them locally, and induces a paralyſis of all the muſcles, which receive branches

branches from thoſe nerves, but by no means brings on death: when the brain is touched by it, the animal immediately dies: the ſame event happens, if the poiſon be inſtilled into it's eyes, which phenomenon ſeems to ariſe from the vicinity of this organ to the brain, and not, according to the opinion of Dr. Schaub, from abſorption by the lymphatic ſyſtem; more eſpecially as Fontana has obſerved this phenomenon in pigeons, but not in quadrupeds. When life ceaſes, the body appears relaxed, and the irritable power of the muſcles is found to be wholly gone. Even the heart of cold-blooded animals is ſoon deprived of the faculty of contracting itſelf, when a few drops of this poiſon are applied to it. The doctors Fontana and Schaub have always found the blood diſſolved in ſuch bodies, the lungs inflamed, the veins diſtended, the dura mater and the cortical ſubſtance of the brain likewiſe turgid with blood, the arteries, on the contrary, empty. Theſe phenomena are, at leaſt for the moſt part, obſerved in ſuch bodies *.

If I ſum up what I have ſaid of the local palſy from the poiſon being applied to the bare nerves; of it's virulence when applied to the eyes, and the brain; and in fine of it's ſpeedy manner of acting; in my humble opinion, it may be concluded, that this poiſon, in all caſes, acts locally on the nerves, deſtroying their power: hence palſy enſues, if the poiſon be applied to the bare nerves; death, if it touch the brain, or any part in it's vicinity; and

* See, on this poiſon, Fontana, l. 1, t. ii, a p. 125 ad 155, et in *Supplemento*, a p. 306 ad 342: Murray, l. 1, t. iii, p. 213: Gmelin, l. 1, p. 282: Plenck, l. 1, p. 110: and Schaub *de Lauro Cerafi Qualitatibus medicis et venenatis.*

hence, in fine, the quick appearance of the morbid effects. As for it's manner of acting with regard to the whole body, it ſeems, that, according to the different doſe, it's action differs: for, if this poiſon be taken in a ſmaller doſe, it incites at firſt the irritable parts to action; however, the poiſon being communicated to the veſſels, irregular motions muſt neceſſarily ariſe, and the whole maſs of blood cannot fail to become affected by the alteration in the action of the veſſels induced by the poiſonous ſtimulus; the blood, changed from it's healthy ſtate, violently reacts on the veſſels, and produces an inflammation of the lungs; the lungs, being inflamed, are unable to propel the blood, and the more as it is conveyed in greater quantity to them, on account of the inordinate action of the veſſels, ſo that they ſoon become oppreſſed, and thus a ſuffocation is produced.

The cauſe of death from this poiſon, when exhibited in a ſmaller doſe, ought therefore to be explained from the diſturbed action of the ſanguineous ſyſtem; and eſpecially from the impeded function of the lungs; as is proved by the empty arteries, and turgid veins. But, when taken in a large doſe, it directly operates upon the vital principle, extinguiſhing the life of the whole body.

The antidote of the laurel water is to be looked for in the ammonia preparata, which remedy not only prevents the noxious effects occaſioned by this poiſon, but alſo often performs a cure, when the ſymptoms have already taken place *. An emetic likewiſe proves uſeful.

* Schaub, l. l.

GENUS II.

Narcotic Acrid Poiſons.

SPECIES I.

Atropa Belladonna, The Deadly Nightſhade.

This plant, on account of it's virulency, is properly ranked among the firſt of theſe poiſons. The noxious quality reſides not only in the berries, but alſo in the ſeeds, leaves, and root, though in a different degree; as the berries ſurpaſs the other parts in virulence. From a large doſe of this poiſon ariſe a dryneſs of the mouth, a trembling of the tongue, a very diſtreſſing thirſt, a difficult ſwallowing, fruitleſs efforts to vomit, and a great anxiety at the præcordia; afterwards the patient is ſeized with delirium, accompanied with gnaſhing of the teeth, and convulſions; febrile motions ariſe from the inordinate circulation; the face grows tumid, and of a dark red hue; the eye-lids being ſtretched open, the pupil is obſerved to be immoveable; a locked jaw is by no means an unfrequent ſymptom; the ſtomach is very inſenſible to ſtimulus; an inflammation of the ſtomach and œſophagus often ariſes, attended with the moſt violent pains of the abdomen; the periſtaltic motion of the bowels is deſtroyed, they are commonly attacked with an inflammation, not unfrequently extending itſelf to the glands of the meſentery, and even to the lungs

lungs and liver. Relaxation of the whole body, languor of all the functions, palsy, especially of the lower extremities, convulsions, dissolution of the blood, dizziness, blindness, propensity to sleep, drowsiness, apoplexy, and death succeed. The body, which soon putrefies, generally swells, and is marked with blackish spots; the blood flows out of the nose, mouth, and ears; and the surrounding atmosphere is infected with an intolerable stench *.

All these symptoms being accurately considered, the manner of acting of this poison seems to be the following. When the deadly nightshade is swallowed, it first excites a great disorder in the animal economy, by impeding the functions of the primæ viæ, and injuring the nervous system; it afterwards enters the blood, where it produces almost the same symptoms as the water of the cherry bay, by destroying the irritability of the heart and vessels, and by dissolving the blood. But the cause of death from this poison is not always the same: the patient very often dies of an apoplexy; yet the vital principle is not unfrequently extinguished by the poisonous stimulus, and sometimes the patient is destroyed by a sphacelus of the alimentary canal.

It appears from this how far the deadly nightshade agrees with the narcotics, and how far it deviates from their manner of acting: for, though it destroys the irritability like the narcotics, it nevertheless acts on the nervous system also, and the brain directly experiences it's noxious power.

* Gmelin, l. l, p. 290 ad 308: Murray, l. l, t. i, p. 626: and Plenck, p. 120.

An

An emetic, a purgative, milk, emulſions, oxymel, and vinegar, prove the beſt antidotes againſt this poiſon.

SPECIES II.

Cicuta Aquatica, The Water Hemlock.

THE root of the water hemlock, when ſwallowed, commonly brings on the following ſymptoms; extreme pain at the region of the ſtomach, anxiety, and heat, violent retching, bloody vomiting, ſwelling of the abdomen, hiccup, thirſt, locked jaw, univerſal convulſions, opiſthotonos, epilepſy, inflammation of the ſtomach and bowels, a gangrene of theſe parts, dizzineſs, delirium, diſtortions of the eyes, bleeding at the ears, extreme weakneſs, relaxation of all the powers, ſleepineſs, apoplexy, and death. After death, the body is ſwelled; the lungs are often found to be inflamed, and even mortified in certain places; the ſurface of the body exhibits blackiſh ſpots; and a bloody foam continually flows from the mouth *.

Analogous ſymptoms, and the diſſections of ſuch bodies, prove, that this poiſon ſufficiently agrees with the former, both in the manner of acting, and cauſe of death: thus what I ſaid of theſe, ſpeaking of the atropa belladonna, is alſo true, mutatis mu-

* See Van Geuns, l. l, p. 46: Gmelin, l. l, p. 334: Plenck, l. l, p. 128: Murray, l. l, t. i, p. 397.

tandis,

tandis, with reſpect to the water hemlock. I ſay, mutatis mutandis, as, notwithſtanding the analogy, a remarkable difference is found between theſe two poiſons in their manner of acting: for, in the firſt place, the patient not unfrequently dies of the latter by ſuffocation; and, ſecondly by it's greater acrimony, it much more violently affects the nervous ſyſtem; and by it's weaker narcotic power, it exerts a leſs powerful action on the irritable parts.

The antidotes are the ſame as for the deadly night-ſhade.

GENUS III.

Acrid Poiſons.

SPECIES I.

Aconitum Napellus, Wolf's-Bane.

THE root of this plant, ſurpaſſing the other parts in virulence, being laid upon the tongue, is found to be of a burning and very acrid taſte, and the tongue is thence not unfrequently affected with a palſy: when ſwallowed, there ariſe nauſea, vomiting, anxiety, looſeneſs, moſt violent pains of the bowels, tumefaction of the abdomen, diſtortions of the eyes, ſpaſms of the jaw, and very ſtrong convulſions, attended with an univerſal rigor; which phenomena are followed by languor of all the functions, and torpor of the vital principle. Vehement commotions then ſucceed, the relaxation of the vital pow-

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ers is again obſerved, and the ſame phenomena repeatedly appear, till at length an univerſal debility, cold ſweats, an aſphyxia and fainting fit take place, which, from the total abolition of the vital powers, ſoon terminate in death. Although the ſymptoms moſtly ſucceed one another in the above order, nevertheleſs a very great difference is ſometimes obſerved: as this poiſon often kills immediately, and without occaſioning convulſions, when taken in a large quantity *.

Theſe ſymptoms clearly prove, that the nerves eſpecially are very violently affected by this poiſon. It operates upon the nerves of the ſtomach, by which the poiſonous ſtimulus is directly communicated to the brain. Hence convulſions, and the other ſymptoms of an affection of the nervous ſyſtem. The nerves ſoon affect the other organs by ſympathy, from which ſource the inordinate motions of the blood-veſſels may be explained. This poiſon thus primarily attacks the nerves, and the primæ viæ alone, and the other organs only ſuffer ſecondarily: for it is not abſorbed by the lymphatic ſyſtem, but remains in the primæ viæ, and the diſorders of the ſanguineous ſyſtem are only to be imputed to the nerves; therefore, thoſe alterations of the blood, which are always obſerved from the narcotics, and partly alſo from the narcotic acrids, are never found in thoſe killed by the acrids. From the ſame reaſon ought to be explained, why, though the

* Van Geuns, l. l, p. 47: Murray, l. l, t. iii, p. 9: Gmelin, l. l, p. 439: and Plenck, l. l, p. 168.

noxious

noxious effects already manifeſt themſelves, and even, though the patients labour under the ſtrongeſt convulſions, ſtill the poiſon may very often be removed, and a ſtop quickly put to it's noxious effects, by the adminiſtration of an emetic.

As to the cauſe of death, it is evident, that a torpor of the vital principle muſt neceſſarily ſucceed to the violent efforts exerted by this poiſon; but as the organs are continually ſtimulated by it, they ſoon again collect all their force, and excite horrible convulſions, by which they in vain attempt to expel the noxious ſtimulus: thus the vital powers become continually more and more enfeebled; they reſiſt however the poiſonous ſtimulus, till at length, the organiſm of the body being entirely deſtroyed, the vital principle is extinguiſhed amid the laſt ſtruggles of reſiſtance. Notwithſtanding that this is, for the moſt part, the cauſe of death, ſometimes an apoplectic fit puts an end to life; but ſuch a cauſe of death only happens accidentally, and cannot be derived from the nature of the poiſon itſelf.

The antidotes are an emetic and a gentle purgative, after which milk and emulſions are to be given, in order to reſtore the diſturbed action of the primæ viæ: antiſpaſmodics too, and even opium, are often requiſite likewiſe, to compoſe the inordinate motions of the nervous ſyſtem.

SPECIES II.

Oenanthe Fiſtuloſa, Hemlock Dropwort.]

THE root of this plant, when ſwallowed, brings on tremblings, convulſions, diſtortion of the eyes, ſpaſm of the jaw, faintings, extreme relaxation, abolition both of the internal and external ſenſes, *tetanus*, and death. This poiſon often acts ſo quickly and violently, that it is not unuſual for the patient to fall down ſuddenly bereft of ſenſe and motion. Dr. Vacher, finding in ſuch bodies the ſtomach, the inteſtines, in a word all the viſcera in a healthy ſtate, and the patient complaining of no pain, concluded, that this poiſon belonged to the narcotics: but if it be conſidered, that the manner of acting of the narcotics is far from being ſo quick; that they produce very different ſymptoms; that an alteration of the blood is always obſerved from them, which never appears from this; and that there are various ſenſations of pain, an obtuſe as well as an acute; I cannot but agree with Dr. Plenck, who has ranked it among the acrid poiſons; which opinion is further confirmed by it's pungent taſte *.

Therefore both the wolf's-bane and the hemlock dropwort primarily affect the nerves only;

* See Plenck, l. l, p. 153: Gmelin, l. l, p. 64: *Philoſ. Tranſ.* vol. 44, part i, p. 227, and vol. 6, part ii, p. 836: Vacher *Acta Helvetica*, vol. iv, p. 69: and Van der Monde, *Journal de Médecine*, t. x, 1758, mois nov. p. 430.

but the latter affects them in a quite different mode from the former: for it does not excite ſtrong convulſions by it's acrimony, but directly deſtroys the energy of the nervous ſyſtem in ſuch a manner, that the vital principle can but feebly reſiſt, and the vital powers are ſcarcely to be noticed. This way of acting however is not peculiar to the hemlock dropwort alone, but is common to the wolf's-bane, and the chief of the acrid poiſons; for, when the wolf's-bane, or any of the others is taken in a large doſe, the ſame phenomenon occurs, convulſions then are never to be obſerved, and the patient ſuddenly expires without them. Thus it appears, that the hemlock dropwort differs not as to it's manner of acting, but only in degree, from the others; and that the reaſon, why the vital powers ſcarcely manifeſt themſelves, ought to be imputed ſolely to their being deadened by it's violence.

As this poiſon agrees with the former in the manner of acting, the cauſe of the death that enſues from it is the ſame likewiſe; with this difference only, that the hemlock dropwort does not extinguiſh the vital principle by repeated efforts, but, as it were, by a ſingle ſhock. In fine, the antidotes to the wolf's-bane prove alſo efficacious againſt the hemlock dropwort.

Before I proceed to treat of the mineral poiſons, I muſt take notice of a law of nature, drawn as a conſequence from the ſix plants above-mentioned; and the more, as it alſo holds good with reſpect to all the other poiſonous vegetables: viz. that all the narcotic plants always act primarily on the irritable parts

parts alone; the acrids attack only the nervous ſyſtem; and the narcotic acrids affect both the nervous ſyſtem, and the irritability of the muſcles: yet I do not deny, but that ſome poiſons may act particularly on this or that organ, though the rule of nature is always conſtant, that, according to their ſtructure, the narcotics primarily affect the irritable parts; the acrids, the nervous ſyſtem; and the narcotic acrids, both.

ORDER III.

The Mineral Poiſons.

THE poiſons of the mineral kingdom may be properly reduced to four kinds, viz. acids, alkalines, *oxyds*, and neutral ſalts. As the ſharp and corroſive taſte of the acids and alkalines prevents theſe poiſons from being uſed, and as the ſubject, which claims my attention, is very extenſive, paſſing by the others, I ſhall ſpeak only of two poiſons of the latter kinds, not only more violent than the reſt, but alſo more frequently mortal; namely, the *oxyd* of arſenic, and the hydrargyrus muriatus.

GENUS I.

Oxyds.

SPECIES I.

The Oxyd of Arſenic.

THIS violent poiſon, when taken in a large doſe, operates like a corroſive, directly deſtroying the life of the parts with which it comes into contact. When taken in a ſmaller quantity, it affects all the parts which it touches with a painful ſenſation, dryneſs, and heat: afterwards ariſe a fever, a very diſtreſſing thirſt, extreme anxiety at the præcordia, nauſea, and very frequent vomiting, pituitous at the commencement, in the end bilious; the ſtomach and bowels ſuffer the moſt grievous pain, inflammation, and corroſion; a violent diſcharging of black, ſtinking, and cadaverous matter from the anus follows; the body ſwells with tenſion; palpitation of the heart, fainting, difficult breathing, the greateſt anxiety, a quick, weak, contracted, and irregular pulſe, jaundice, and tremblings enſue; the extremities grow cold; cold ſweats, eſpecially of the forehead, appear; gangrene, ſphacelus of the ſtomach and bowels, and a ſeparation of their internal membrane at certain places, delirium, and death, ſucceed. On opening the body, the ſtomach and bowels are found corroded in ſuch a manner, that they ſometimes ſcarcely ſurpaſs a poppy leaf in thickneſs; the blood is always diſſolved; livid ſpots appear all over the ſurface of the body; the nails become blue, and not unfrequently fall off, together with the hair, within

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the firſt day after death; a ſeparation of the epidermis, and putrefaction of the whole body take place; and even ſome limbs drop off, either ſpontaneouſly, or upon the ſlighteſt effort, at leaſt this phenomenon has been obſerved in ſeveral caſes. In fine, perſons are often ſlowly or ſpeedily killed by arſenic externally applied; and a woman in a ſhort time dies, if arſenic be put into her vagina. Such a caſe is recorded in the tranſactions of the royal medical ſociety of *Copenhagen*. A farmer, having in vain attempted to poiſon his wife with arſenic adminiſtered in the uſual manner, being informed by an old woman, that the ſlighteſt injury of the vagina was mortal, put arſenic mixed with meal into the vagina of his wife in the morning, between ſeven and eight o'clock, after coition. The woman, hitherto enjoying perfect health, was unawares attacked at three o'clock in the afternoon with a continual ſhivering, chillneſs, and a burning pain of the vagina. The huſband, having confeſſed the crime, in vain attempted to ward off the danger by an injection of milk. A vomiting, pain of the mouth of the ſtomach, and anxiety came on: then the woman lay, as it were, in a dying condition during ſome hours: afterwards vomiting, and delirium ſucceeded, and ſhe died the following day at twelve o'clock in the morning. Abilgaard, profeſſor of the veterinarian art in the academy of Copenhagen, demonſtrated by experiments made on purpoſe upon two mares, that the cauſe of her death ought to be attributed ſolely to the arſenic introduced into the vagina *.

Arſenic

* See, on this poiſon, *Acta Hafniens.* t. iii, p. 178: Plenck, l. l, p. 271: Gmelin's *Apparat. Medicam.* vol. i, p. 250: Mead,

Arſenic ſeems therefore to operate in a different manner, according to the different way in which it is uſed: for, when taken in a large doſe, it extinguiſhes life by it's power of corroding, and deſtroying the organiſm of the parts. When ſwallowed in a ſmaller doſe, as it does not inſtantly deſtroy the organiſm of the parts it touches, it extremely irritates the œſophagus, ſtomach, and bowels; which, being injured by it's violent ſtimulus, react with the greateſt force, and at the ſame time, on account of the ſympathy which more eſpecially exiſts between the head and the ſtomach, communicate the poiſonous ſtimulus to the former organ, and by it's means to all the others: hence the great number of ſymptoms, obſerved in ſuch caſes. Death indeed enſues; but the moſt violent pains and convulſions are it's forerunners: and theſe contribute to the deſtruction of the frame by farther breaking down the vital powers, ſo that death, already on the point of enſuing from the alteration of the organical ſtructure of the primæ viæ by arſenic, is yet more accelerated by the great diſorders, which ariſe from the re-action of the vital principle.

Therefore, in my humble opinion, arſenic, when it kills ſuddenly, is not abſorbed, but remains in the primæ viæ, and excites all the other ſymptoms only by ſympathy.

Moſt phyſicians, and among them the learned Dr. Mangor, are of a contrary opinion: their main arguments are the following.

lib. de Venenis, tentam. iv, p. 108: Van Geuns, I. 1, p. 45 and 46: and Fothergill, in *Medical Obſervations and Inquiries*, vol. 1, art. 37, p. 394.

1. That

1. That it is proved by many obſervations, that arſenic is eaſily abſorbed, when externally applied in ſcald heads, ulcers, and cancer; and that, though the ſkin be not removed, arſenic, under the form of a plaſter, ſometimes produces the moſt violent ſymptoms, and even ſudden death. It is beyond all doubt, that death ſometimes enſues from the external application of arſenic; yet it is not proved by any argument, that the *oxyd* of arſenic itſelf is abſorbed in ſuch caſes. For arſenic in the form of an oxyd, being externally uſed, acts as a cauſtic, deſtroys the ſurface, to which it is applied, and no abſorption of it takes place.

2. That the effects of arſenic are often greater in a remote part, than in that, to which it was applied; as is proved by the falling off of the hair, giddineſs, inflammation of the upper part of the *ſtomach*, cough, cholic, and vomiting, all which ſometimes ariſe from arſenic externally applied. In reality, this argument would be of the greateſt weight, were it not proved by the very nature of the ſymptoms, that they may be explained much better from the law of ſympathy, than from the abſorption of the arſenic; and the more, as they are obſerved only in delicate ſubjects; in others, arſenic, when outwardly applied, generally exciting no diſorders.

3. That only a portion of the arſenic was found, after death, in the vagina both of the woman, and of the mare, and that thus the reſt, being ſlowly diſſolved in the vagina, muſt have been taken up by the lymphatic ſyſtem. But when it is conſidered, that this diminution of the arſenic may be well explained both from the

flowing of the humours, always ſecerned by the vital power to obtund an acrid ſtimulus, and from many other accidental cauſes, without having recourſe to the abſorption of ſuch an acrid ſubſtance, which beſide is refuted by the accompanying phenomena; if I add, that milk was injected into the vagina of the woman; it will appear to every one, that no argument can be drawn thence againſt my opinion.

4. That the lungs were found black, livid, and the blood diſſolved in the body both of the woman and the mare. But if arſenic be ſwallowed, the gangrene of the lungs is ſo ſeldom obſerved, that the moſt accurate authors Plenck and Gmelin have not taken notice of this ſymptom, which, therefore, ſeems to be better derived from the ſympathy exiſting between the thorax, and the genitals: and as to the diſſolution of the blood in the veins, not the leaſt argument can be drawn from this ſymptom, as it is likewiſe obſerved in thoſe ſlain by an electric ſhock; yet nobody will ſuppoſe, that the diſſolution of the blood is in this caſe an effect of the abſorption of the electricity.

Theſe are the arguments, with which they defend their opinion; but they are far from ſufficient to demonſtrate the abſorption of the arſenic. On the other ſide of the queſtion, I have three obſervations at hand, which, in my humble opinion, evidently prove, that no abſorption takes place.

The firſt is taken from the elective power of the orifices of the lymphatic veſſels: for as all acrids,

acrids, and even the *ferrum vitriolatum*, though mixed with a great quantity of water, are rejected by the abſorbent veſſels *: is it to be believed, that the lymphatics, which do not abſorb the *ferrum vitriolatum*, on account of it's ſtimulus, would take up arſenic, greatly ſurpaſſing the *ferrum vitriolatum* in acrimony?

Secondly, the medicines, by which the noxious effects of this poiſon may be ſtopped, no leſs prove my opinion. It is well known, that hepar ſulphuris calcareum affords the beſt antidote for perſons poiſoned by the oxyd of arſenic, and that they are cured by taking a ſolution of this medicine in large quantity; if it be but made uſe of previous to the deſtruction of the organical compoſition of the ſtomach and bowels. As it is evident, that the hepar ſulphuris calcareum cannot put a ſtop to the dreadful effects of this poiſon, but by forming a new and innoxious compoſition by it's union with the oxyd of arſenic contained in the primæ viæ; it follows of courſe, that no abſorption of it takes place.

For the third, which is of the greateſt importance, I am obliged to Dr. Mangor himſelf, who records, that one of the mares, upon which Dr. Abilgaard made his experiments, was cured by injections alone, after her vagina had been filled with arſenic during at leaſt twelve hours, and the uſual effects of the poiſon had already partly appeared. Which obſervation manifeſtly proves, that arſenic is not abſorbed, but that, being taken, it acts

* See my Diſſertation *De Cauſa Abſorptionis*, cap. ii, § 10.

topically in the primæ viæ, and affects the other organs only by ſympathy: for the effects of the poiſon had already appeared, and yet a topical remedy was ſufficient to cure; therefore I do not doubt, but, that the arſenic itſelf is never abſorbed.

This however is true only, with reſpect to the *oxyd* of arſenic, a violent corroſive, but not with regard to the other leſs acrid preparations of the mineral. For if arſenic be given in a very ſmall doſe, eſpecially when uſed in a ſolution with alkali, &c., it's deleterious power is determined in a quite different manner: it then no more excites an inflammation, or corroſion, but diminiſhes and deadens the functions of the body, by deſtroying it's organical ſtructure by ſlow degrees; therefore marks of an inflammation of the ſtomach and bowels are never found in the bodies of patients killed by arſenic adminiſtered in ſuch a way; on the contrary, in ſuch caſes, arſenic, having loſt it's corroſive power, is carried with the chyle to the inteſtines, where the diſguiſed poiſon, having impoſed upon the elective power of the orifices of the lymphatics, is abſorbed together with the chyle by them: and the abſorbent veſſels convey this metallic ſubſtance, unfit for aſſimilation, as it were crude or unaſſimilated to the ſanguineous ſyſtem. However, as this ſyſtem can as little aſſimilate the arſenic as the lymphatics, the maſs of blood is infected by the poiſon: but as ſoon as the poiſon is communicated by means of the veſſels to all the parts of the body, the noxious effects of the arſenic ſhow themſelves, the vital power of the organs becomes diminiſhed, and all the functions gradually languiſh;

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theſe ſymptoms daily increaſe, becauſe the ſolids are continually more and more weakened and depraved by the blood imbued with the poiſonous quality of arſenic: pains ſhifting through the whole body, a choking thirſt, a conſumption, and a hectic fever ariſe; and at length the organic ſtructure of the body being wholly deſtroyed, death cloſes the ſcene.

GENUS II.

Neutral Salts.

SPECIES I.

Hydrargyrus Muriatus.

THIS preparation of mercury is to be ranked among the ſtrongeſt poiſons of the mineral kingdom. When taken it occaſions a dryneſs of the mouth and tongue, an inſatiable thirſt, a violent retching and obſtinate vomiting, a burning and rending pain of the ſtomach, griping of the bowels, a bloody flux, an inflammation and gangrene of the ſtomach, and inteſtines, convulſions, faintings, the utmoſt relaxation of the powers, hoarſeneſs, cold ſweats, and death ſucceed. The body ſoon putrifies, and corroſions of the ſtomach and inteſtines are almoſt always obſerved from this poiſon.

As it agrees with arſenic in it's phenomena, and differs from it only in it's degree, the manner of acting

acting and cauſe of death are likewiſe found to be analogous: for if it be ſwallowed in a large doſe, like arſenic it immediately deſtroys the vital principle, and kills without occaſioning convulſions: when taken in a ſmaller quantity, it deſtroys life partly by ſtimulating the ſolids, and farther reducing their powers in conſequence of producing irregular motions; and partly by it's corroſive, and deſtructive quality.

But phyſicians do not agree with reſpect to the manner in which this poiſon operates when diſſolved in water or brandy, and taken according to the preſcription of the celebrated van Swieten. Van Swieten himſelf records many inſtances of patients cured of various diſeaſes by it's uſe*: the experiments made with this medicine upon engliſh ſoldiers, by order of the illuſtrious Pringle, favour this opinion†: the fame is aſſerted by the celebrated Stoll, who nevertheleſs does not deny, but that it had ſometimes injured: in fine, this aſſertion is ſupported by the Drs. van der Eem, and van Leeuiven, who enumerate a long catalogue of diſeaſes cured by this preparation of quickſilver‡. On the other hand, the chevalier Brambilla writes, that the hydrargyrus muriatus had not only failed of anſwering the purpoſe, but that ſpitting of blood, conſumption, and palſies, have not unfrequently ariſen from it's uſe. He thinks therefore, that van

* *Commentaria* in *Aphoris.* Boerhaavii, t. v, § 1477, p. 549.

† *Medical Obſervat. and Inquir. vol.* i, *art.* 28, and *vol.* ii, *art.* 3 and 4.

‡ *De Uſu Venenarum in Medicina Act. ſervand. Civib,* t. xi, p. 668, and the following.

Swieten

Swieten and Pringle were deceived by those to whom the cure of the patients was committed*; with which opinion the observations of Plenck and Quarin agree; the former of whom observes, that it's use produces a consumption, a spitting of blood, and a cough; and is of opinion, that physicians ought totally to refrain from the use of this medicine †: the latter speaks thus: "I have "known some to be benefitted by the sublimate; "yet it has injured most patients, and I have "seen, that a contraction of the limbs, incurable "diseases of the nerves, hemoptoes, and deadly "consumptions, have arisen from its administra-"tion. Perhaps it may sometimes be of utility "in strong men, or in men of a lax torpid habit, "but it ought unquestionably to be condemned in "very irritable patients, or those of weak lungs‡." Dr. Girtanner is of the same opinion, asserting, that the symptoms of the venereal disease indeed entirely disappear within a few days, but that the viper lurks under the grass, and the disease afterwards returns with greater force; to prove which he has collected a great number of observations from different physicians, and in fine he relates from his own experience, that all the patients, who had made use of this medicine, died of a consumption within a few years§. Lastly, the celebrated Fourcroy seems to recede but a little from this opinion; for he says,

* *Chirurgische practische Abhandlung von der Phlegmone, und ihren ausgangen*, ii *Theil*, p. 363.

† L. l, p. 263.

‡ *Animadv. pract. in diversos Morbos*, cap. xvi, p. 318.

§ *Abhandlung uber die venerische Krankheit*, i *Theil*, lib. iv, capitel 16, p. 360.

it

" it is requiſite, that the lungs be in a ſtrong ſtate, " when this remedy is adminiſtered, as great pru- " dence is requiſite. It is a dangerous affair, that " the preparations of quickſilver, eſpecially it's " ſalts, ſhould be in the hands of ſo many perſons, as " I have often obſerved very pernicious effects from " their inconſiderate uſe; and I think, that precau- " tions ought to be taken in this buſineſs by the " public authority *." In this difference of opinions, comparing all together, it ſeems to me that the following conſequences may be drawn.

1. Though it appears, from the obſervations above mentioned, that the hydrargyrus muriatus can by no means be indiſcriminately adminiſtered, and ought never to be given without precaution, yet I cannot thence conclude, with Dr. Plenck, that this remedy never ſhould be inwardly taken: and the leſs as the Drs. *van der Eem*, and *van Leeuwen* have proved by a great number of obſervations, that this remedy has affected a cure in many diſeaſes, in which all others were tried in vain; even in the venereal diſeaſe, though, in general, this complaint may be radically cured by other preparations of mercury more mild in their manner of operating, and of courſe the hydrargyrus muriatus ought never to be employed generally for the cure of the lues venerea; yet we ſometimes meet with caſes, eſpecially if the diſorder have been of long ſtanding, which reſiſt the exhibition of all other preparations, and to effect a radical cure the practitioner muſt have recourſe to the hydrargyus muriatus.

* L. l, t. iii, chap. xv, p, 136 and 137.

2. Though

2. Though the hydrargyus muriatus, when properly adminiſtered, affords a powerful medicine in many obſtinate diſeaſes, nevertheleſs ſome rules and cautions are to be obſerved in uſing it. This medicine ought never to be preſcribed to thoſe, who have tender lungs, or are diſpoſed to conſumption; it is alſo unfit for ſuch as have the firſt paſſages weak, or very irritable: in like manner it ſhould not be given to men of a tender and delicate fibre; it is generally hurtful to women with child, or lying-in: even to men, at leaſt in the beginning, it ought to be given, in a ſmall doſe; for it operates very violently on ſome perſons. I agree therefore with the immortal Boerhaave, "that the hydrargyrus has wonderful effects in many incurable diſeaſes, when "cautiouſly given by a prudent phyſician, but let "thoſe refrain, who are unacquainted with he "proper mode of adminiſtering it *."

3. As the bark, when taken with the ſolution of van Swieten, prevents the noxious effects ſometimes obſerved from it's uſe; while it does not in the leaſt deprive it of it's antivenereal power, as is proved by the conjunction of the hydrargyrus with the bark generally recommended when any body labouring under the venereal diſeaſe is farther attacked with an intermitting fever; the bark may be joined with the greateſt advantage to this ſolution in many caſes; and the more, as it is demonſtrated by the obſervations of modern phyſicians, that both the mercurius dulcis, and the hydrargyrus muriatus, when united with the bark, may be exhibited in the lues venerea,

* *Elem. Chym.* t. ii, *proceſſus* 198, p. 488.

without

without any danger even to patients, whoſe conſtitutions do not otherwiſe admit of their uſe.

4. As it is at preſent beyond all doubt, that both the hydrargyrus muriatus and the mercurius dulcis are decompoſed by all vegetable aſtringents, and that gallas hydrargyri is produced from the union of the acid of galls, to which plants owe their aſtringent power, with the quickſilver, it follows, that the oak apples, and the bark, containing the greateſt quantity of this acid, muſt likewiſe be the beſt antidotes againſt this poiſon. As, moreover, mercurials, when taken together with the bark, retain their antivenereal power, it is evident too, that, at leaſt in the cure of the venereal diſeaſe, the gallas hydrargyri affords a remedy free from all danger, and inferiour in efficacy to no other preparation of mercury.

APPENDIX TO THE POISONS.

The Poiſon called Tucumas.

OF all the poiſons, the nature of which is hitherto concealed, I ſhall only mention this famous american poiſon; becauſe the illuſtrious Fontana has made many experiments upon it, according to which it appears to have the following properties. It does not injure either by the ſmell or taſte, in both which it bears a ſtrong reſemblance to licorice: it poſſeſſes neither the properties of an acid, nor of an alkali: when ſwallowed, it in reality proves noxious,

noxious, but then a very large doſe is requiſite to occaſion death: applied to the ſkin it does no injury, whereas communicated to the body by the ſlighteſt wound, it is certain death. It nevertheleſs acts leſs ſpeedily than the poiſon of the viper, and the exciſion or burning of the wounded part affords the beſt antidote: it does not affect every kind of animal with the ſame violence, as ſerpents, vipers, worms, and inſects, are not liable to it's noxious effects; though other animals, ſuch as frogs for inſtance, die in conſequence of them. Applied to the bare nerves, the poiſon is not communicated to the body; but when injected into the blood veſſels it inſtantaneouſly kills, and without cauſing convulſions. In animals killed by this poiſon the lungs are found to be inflamed; the arteries contain no blood, the veins, on the contrary, are turgid; the blood is of a black hue, and does not coagulate; the muſcles are univerſally flaccid, and more pale than uſual.

The common ſymptoms, which enſue from the introduction of the poiſon by means of a wound, are convulſions, a ſudden relaxation of all the powers, and an abolition of ſenſe and motion: afterwards the animal is attacked with an univerſal palſy, the reſpiration is impeded, and lethargy, followed by death, enſues: but if the animal do not die, it is reſtored to it's former health within a few hours. It is farther remarkable, that this poiſon, though in other reſpects extremely injurious to the irritability, according to the obſervations of Dr. Fontana, does not diminiſh the power either of the heart or of the bowels *.

* Fontana, l. I, t. ii, a p. 83 ad 124, *Philoſ. Tranſ.* vol. 44, p. 408, and vol. 47, p. 75, and van Geuns, § 45, p. 55 and 56.

With

With reſpect to the manner of operating of this poiſon, it ſeems to be taken up by the abſorbent veſſels, and to be conveyed by them to the ſanguineous ſyſtem, but as ſoon as it enters this ſyſtem, it acts on the veſſels, occaſions irregular motions, and deſtroys the irritability both of theſe and of the other muſcular parts by it's violent ſtimulus. Beſides, the blood tainted with a poiſonous quality produces an inflammation of the lungs, and puts a ſtop to their function.

As now no part of the human body can be injured by a morbid power, without the vital principle attempting to repel the ſtimulus, the nervous ſyſtem and the other organs become affected by ſympathy: therefore though the nerves do not primarily ſuffer from this poiſon, they are nevertheleſs always ſecondarily affected by it.

Let it not be argued againſt this explanation, that the abſorption of this poiſon is not probable, as the ſkin is not deſtitute of lymphatic veſſels, and a much greater quantity of this poiſon is requiſite when ſwallowed. Theſe objections do not refute my opinion; for, beſide that, as we ſaw before, the trunks of the lymphatics abſorb ſtimulating ſubſtances much better after their radiated extremities are deſtroyed by a wound or ulcer, it is highly probable, that the orifices of the abſorbent veſſels enjoy a different ſtructure, according to the different offices to which they are deſtined by nature; as the celebrated Maſcagni has proved, that the ſtructure of the lymphatic ſyſtem varies, ſo as to be adapted to the different matters to be taken up: therefore,

though

though the power of aſſimilating the contained humours is common to the whole abſorbent ſyſtem, ſtill it is not equally vigorous in all the parts of this ſyſtem: and even this poiſon muſt undergo a great change in the lymphatics, when communicated by a wound; becauſe otherwiſe, in the ſame manner as when it is directly mixed with the blood by an injection into the veſſels, the animal would be inſtantaneouſly bereft of life.

Thus, in my humble opinion, this poiſon primarily affects only the irritable parts, and the lungs; and the other organs ſuffer by ſympathy alone: ſo that the cauſe of the death brought on by it is to be derived from the inordinate action of the ſanguiferous ſyſtem, and eſpecially from the impeded function of the lungs.

CLASS VII.

Death from universal Diseases.

This Class comprehends the idiopathic Fevers and febrile Diseases. It is thus naturally divided into two Orders.

ORDER I.

Fevers.

AS fevers are the most frequent of all the disorders to which human nature is liable, particular attention ought to be paid to them in a work of this kind. It is somewhat difficult to give a nominal definition of fever; for though fevers are generally attended with some degree of chillness, increase of heat, and frequency of pulse, and the vigour with which the animal functions are performed is diminished; yet it is well known, that fevers do occur, in which the stated phenomena are not met with, and we are not acquainted with a single symptom, that invariably takes place in every fever; fortunately however, though we cannot define fever, practitioners are seldom at a loss to know whether it be present or not.

The remote causes of fever are numerous, and there are but few noxious powers, that under some circumstances may not bring on fever: they all however operate only in two ways; namely, they either excite febrile motions by weakening the system by their sedative quality; or they produce the

the ſame effect by ſtimulating the body too much. In both caſes the irritability of the body is increaſed in conſequence of the real or ſpurious irritation of the vital principle, and fever makes it's appearance. The proximate cauſe of fever conſiſts thus in increaſed irritability of the ſyſtem, and fever may be defined a ſalutiferous effort of the *natura medicatrix*, to get rid of the noxious ſtimulus; for in the beginning of the paroxyſm of fever, there is always a kind of laſſitude, chilline ſs, and debility, in conſequence of a noxious ſtimulus making an attack upon the general ſyſtem; but the vital principle being rouſed, in order to reſiſt the ſtimulus applied, the colour of the ſkin returns, and an increaſe of heat is diffuſed over the whole body; till at laſt the enemy being repelled, or at leaſt checked in it's action, a reſolution or diminution of the fever takes place with relief of all the ſymptoms. This is eſpecially illuſtrated by conſidering the different ſtages of an intermitting fever during it's paroxyſm. In the firſt ſtage the languor, paleneſs of the face, and extremities, the ſpaſmodic contraction of the veſſels on the ſurface of the body, rigor, ſmall irregular pulſe, anxiety, oppreſſion at the precordia, and diminution of all the ſecretions, are ſo many tokens of a noxious ſtimulus exerting itſelf to deſtroy life: whereas in the ſecond ſtage there are two powers acting; one, that of the noxious ſtimulus, having a tendency to deſtroy the animal economy; the other, that of the vital principle endeavouring to correct and to remove the morbid power by increaſed action. Hence the high colour of the urine, the ſtrong and hard pulſe, the pain in the back, head, and extremities, the increaſe of heat, and the

return of the colour of the ſkin, with tenſion and redneſs; which terminate in the third ſtage or criſis of the diſorder, as ſoon as the enemy has been conquered by the *natura medicatrix*.

According to the different degree of violence, with which the morbid ſtimulus operates, and the different re-action and ſtrength of the affected body, the fever makes it's appearance under a different form. This has given riſe to the diviſion of fevers into intermittent, remittent, and continued, of which many varieties are recorded by writers on the ſubject. All theſe however may be properly reduced to the five following kinds; the nervous, the intermittent, the gaſtric, the putrid, and the inflammatory fever; which, on account of their frequently occurring, deſerve particularly to be inquired into.

The intermitting fever.—We have already deſcribed the ſymptoms of the ague, which is divided, according to the duration of the interval between the paroxyſms, into quotidian, tertian, and quartan, which may be either ſingle or double. The intermitting fever is never dangerous in itſelf, though it may deſtroy life, when it's manner of acting upon the human body is changed by any accidental circumſtance: for it is well known, that intermittents are modified by the prevailing epidemic, the ſeaſon of the year, and the conſtitution of the patient. The danger, duration, and treatment of the diſeaſe depend eſpecially on the character of the prevailing epidemic. Of this we have a ſtriking inſtance in the epidemic

fevers

fevers attended with a comatoſe affection of the brain, which terminate in a mortal apoplectic fit, unleſs a large doſe of opium, given in, or ſtill better a ſhort time before the paroxyſm, takes away this tendency to apoplexy. The ſeaſons likewiſe greatly influence the nature of the ague; as, according to the different time of the year, it partakes of an inflammatory, bilious, or putrid diatheſis. Hence Sydenham diſtinguiſhes agues into vernal and autumnal. In fine, in the prognoſis of intermitting fevers, attention ſhould be paid to the conſtitution of the patient: for even the vernal intermittents, though often ſalutary by their purifying the general ſyſtem, may deſtroy life in old people, and in thoſe of a bad habit: for life languiſhes in ſuch ſubjects, and therefore the organs cannot duly counteract the morbid ſtimulus.

With reſpect to the cure of intermittents, this is to be performed by the exhibition of an emetic given a ſhort time before the acceſſion of the paroxyſm; by clearing the primæ viæ, in caſes where ſordes exiſt, by rhubarb and calomel, by which the ſordes are at once effectually expelled from the body. This mode of evacuating the alimentary canal is far preferable to the protracted uſe of ſaline remedies, in order, as it was ſaid, to prepare the ſyſtem for the uſe of tonics; ſince it is at preſent clearly proved, that the morbid affections of the abdominal viſcera, dropſies, and other diſorders, which ſometimes ſucceed to intermittents, do not ariſe in conſequence of the bark being given too early, but originate from the long continuance of the ague, from the neglect of bark in the beginning, or from it's not

being uſed in a ſufficient doſe. But above all, the bark muſt be given during the intermiſſion in a ſufficient quantity for the prevention of the return of the paroxyſm: for, in fever, of all tonic remedies the bark is juſtly deemed the moſt effectual. The continuance of the apyrexy will point out the intervals, in which it ought to be taken; the ſhorter the time of intermiſſion between the paroxyſms, ſo much the larger muſt be the doſe, and the more frequently the bark ſhould be adminiſtered, in order to prevent the fever from changing into a remittent or continued one. There are three kinds of bark, the common, the red, and the yellow; the latter two are far the more efficacious, and often bring about a cure, where the former has failed. In all caſes, if poſſible, the bark is to be given in ſubſtance, as being thus the moſt powerful; but often the patient cannot bear the exhibition of the bark itſelf, in which caſe recourſe is to be had to it's decoction, hot or cold infuſion, extract, and tincture. If the irritable ſtomach of the patient cannot bear the bark in any form, and if no medicine be capable of removing this irritability, which however but very ſeldom will be the caſe, then the bark is to be introduced into the ſyſtem by the means of glyſters; though this mode is by no means ſo efficacious, as that of taking the bark by the mouth. The bark is beſt given by itſelf; it is however uſeful, to add ſome ginger and licorice to it, in order to give it a more agreeable taſte. In caſe the irritable ſtomach ſhould not be capable of bearing it, the *potio antemetica* of Riverius, that is the ſal abſynthii ſaturated with lemon juice, or the vegetable acids alone, ſhould be given along with it. When the inteſtines

do

do not bear the bark well, ſome tincture of cinnamon, and catechu, will generally ſtop the looſeneſs brought on by the cinchona: but ſuppoſing theſe remedies ſhould prove ineffectual, the cinchona is to be mixed with gum arabic, or with ſaleb, and opium is to be combined with it. When the bark renders the patient coſtive it is much better to keep the body open by gentle laxative glyſters, than to add rhubarb to it.

It has been pretty generally the faſhion, previous to the exhibition of the cinchona, to teaze the patient a good deal with the various preparations of antimony. Some phyſicians have carried this idea ſo far, as to give emetic tartar along with the bark, under the miſtaken notion, that antimonials prepare the body for the uſe of the cinchona, and promote it's operation when combined with it. That a vomit, exhibited a ſhort time before the acceſſion of the cold fit, even though the ſtate of the ſtomach do not indicate it, frequently removes the fever by throwing the ſyſtem into other motions, and rendering the body more ſuſceptible of the ſalutiferous operation of the cinchona, ſo that the bark, before ineffectual, now is capable of conquering the diſeaſe; that it is ſtill more advantageous to give the emetics not in their full doſe at once, but in ſmall doſes at ſhort intervals, ſo as to ſecure their vomiting effect, are facts founded on experience; but the preparative exhibition of the antimonials, and their combination with the bark, do nothing but weaken the body, and impede, or at leaſt retard the ſalutary operation of the cinchona; and I have

never ſeen any other than bad effects from their exhibition.

Although the bark, when given in large doſes, and for a ſufficient length of time; for it ſhould be continued until the patient has miſſed ſeveral paroxyſms, and afterwards the quantity be diminiſhed by ſlow degrees; will but ſeldom fail to remove the fever, yet it is to be acknowledged, that now and then intermittents do not yield to it's exhibition. In theſe caſes I have ſometimes ſeen the common fever cured by the exhibition of a decoction of the *cortex ſalicis albæ* and gentian, by the flores arnicæ given either in ſubſtance or in infuſion, by camomile flowers and alum, and by combining the bark with the ſerpentaria virginiana, or with the preparations of ſteel; but arſenic is more certain than any of theſe in it's operation, and ſoon puts a ſtop even to the moſt obſtinate intermittents. It is however to be obſerved, that what I have ſtated on the cure of intermittents holds good only with reſpect to the ſimple idiopathic ones; for if the intermittent ſhould be complicated with other diſeaſes, then remedies ſuited to the nature of the diſeaſe, with which the ague is combined, are to be uſed along with the cinchona, by which mode both diſeaſes are commonly removed. There is a kind of intermittent which *frequently* obſerves the period of a quartan, and which originates from a morbid condition of the abdominal viſcera, eſpecially of the liver. In theſe caſes the intermittent is but a ſymptom of the diſeaſed abdominal viſcera; and as theſe febrile motions are very uſeful in aſſiſting nature to overcome the diſeaſe, it would be madneſs to check nature in it's ſalutiferous effort by exhibiting bark; unleſs

unleſs the *natura medicatrix* poſſeſſes ſufficient power to bring about the deſired effect; the remedies which, under ſuch circumſtances, cure the fever, and remove the morbid condition of the viſcera, are aperients. In caſes where the patient is of a cold phlegmatic temperament, of an advanced age, or of a torpid relaxed habit, aperients of a hot ſtimulating kind ſhould be given, ſuch as the extractum hellebori nigri, chelidoniæ majoris, cardui benedictæ, gentianæ, the gummi ammoniacum, galbanum, ſagapenum, myrrha, aſafœtida, guaiacum; ſquills; the root of wake robin; ſal ammoniac; ſulphu rauratum antimonii 3 ties præcip.; kermes mineralis; and the tartarus emeticus: whereas in young perſons of a ſanguine or choleric temperament, or of an irritable delicate conſtitution, theſe remedies would do a great deal of harm, and medicines of a leſs ſtimulating nature, commonly called the cooling aperients, accompliſh the cure; among which the cremor tart., the tartar. tartariſat., the terr. fol. tart., the extr. taraxaci, graminis, marrubii albi, the radices taraxaci, graminis, bardanæ, ſaponariæ, & quinque aper., ſoap and rhubarb, are the chief. Mercury may be given along with the aperients of both kinds, with conſiderable benefit to the patient, eſpecially when the liver is the organ affected. The uſe of the viſceral glyſters, according to the mode of the celebrated Dr. Kempff, likewiſe extremely promotes the cure, eſpecially in conjunction with the exhibition of aperients by the mouth.

During the paroxyſm, opiates are to be given in the commencement of the hot fit, as it is at preſent clearly proved, that theſe medicines ſhorten it's duration

ration, and promote the reſolution of the diſeaſe. Lemonade, or nitre and ſugar, given in cold water, may be likewiſe exhibited. In the firſt ſtage nothing can be done, but to render the fit milder by the tepid bath, and by exhibiting a warm infuſion of elder or chamomile flowers, given in a moderate quantity. The diet of the patient, during the intermiſſion, ought to be of the nouriſhing kind, and a moderate quantity of wine is to be recommended, eſpecially when tokens of a general weakneſs appear.

The gaſtric fever is known by a foul tongue, a bitter taſte in the mouth, eſpecially in the morning, a ſallow countenance, watchfulneſs and anxiety, languor and debility, vertigo, a tremulous motion of the lower lip, pain in the head, ſhoulders, and the back, a quick, ſmall, unequal, generally ſoft, but ſometimes hard pulſe, great thirſt, a loſs of appetite, a ſenſe of weight, fulneſs, and heat in the precordia: ſometimes pain in the ſide, tenſion of the abdomen, retching, and vomiting itſelf. There is ſcarcely any diſeaſe, which ſooner yields to the power of phyſic, than the bilious or gaſtric fever, when properly treated in it's commencement. The phyſician ought immediately to have recourſe to means by which, in a ſhort time, the primæ viæ may be effectually cleared; which are vomits, purgatives of rhubarb, calomel, cremor. tart., and magnes.: the patients ſhould drink plentifully of lemonade, made with lemon juice or concentrated acid of tartar: and a decoction of the graſs root, or of the dandelion, combined with their extracts, and ſome of the cooling neutral ſalts, for inſtance, the tartarus tartariſatus, the ſal. polychr. ſeign., or the terr. foliat.

foliat. tart., given in the mean time, will conſiderably aſſiſt the operation of the vomits and purgatives. Sometimes the gaſtric fever, inſtead of being bilious, partakes of the pituitous character. In theſe caſes the tongue is covered with a thick white cruſt; the taſte, inſtead of being bitter, is like that of rotten eggs; the countenance of the patient is pale, and the habit relaxed and torpid. If under ſuch circumſtances the practitioner ſhould immediately proceed to the uſe of emetics and purgatives, theſe would be incapable of anſwering the purpoſe, for the ſordes adhere ſo firmly to the alimentary canal, that they require the uſe of reſolvents for a few days, in order to prepare them to be expelled from the body by vomiting and purging. For this purpoſe nothing proves more efficacious, than two or three grains of the emetic tartar, given in a mixture along with the neutral ſalts. Purgatives ought here to be more of the ſtimulating kind, ſuch as ſenna and jalap; and aperient glyſters may be exhibited at the ſame time with advantage. The primæ viæ being cleanſed by theſe means, the ſyſtem is to be ſtrengthened, in order to prevent a relapſe of the diſeaſe by bitters, the cinchona, the preparations of ſteel, the uſe of wine, and a nouriſhing diet.

But though I grant, that, in true bilious fevers, the firſt indication is to clear the primæ viæ, and that tonics, previous to the uſe of evacuants, often do a great deal of harm; yet I am very much diſpoſed to doubt, whether the phyſician, in all caſes where ſordes of the primæ viæ appear, is juſtified in exhibiting reſolvents and evacuants. For in every fever, where the patient has been teaſed with

with a long continued uſe of ſuch remedies, the conſequence is, that the organs of digeſtion are conſiderably weakened: hence the primæ viæ are filled with ſordes, as the weak organs of digeſtion are incapable of performing their function: every day a morbid matter is generated afreſh; and the longer the practitioner goes on with the uſe of reſolvents, in the larger quantity are the ſordes accumulated in the primæ viæ, the tongue becomes daily more and more foul, and the appetite is loſt; becauſe the tone of the alimentary canal is continually enfeebled by the operation of ſuch remedies. Beſides, a continual ſtimulus on the primæ viæ being kept up by them, according to the law of nature, that the more any organ is incited to action, the more humours are ſolicited towards it, the excretions of the primæ viæ are promoted; whereas the other ſecretions, eſpecially the inſenſible perſpiration, are materially diminiſhed. It would be madneſs under ſuch circumſtances, to perſevere in uſing reſolvents and aperients: it is true, that a morbid matter is diſcharged by them, but the evacuation of a bilious or pituitous matter after the exhibition of emetics and purgatives by no means always proves, that the morbid matter exiſted previous to their uſe, and the phyſician has been juſtified in giving them, for it is well known, that the moſt healthy man will vomit bad bile after having taken an emetic three or four times, and if perſons in health ſhould take neutral ſalts for ſeveral days, the conſequence would be an oppreſſion on the precordia, loſs of appetite, and a foul tongue. As thus in theſe caſes the ſordes of the primæ viæ originate from the weakened tone of the primæ viæ, and are frequently

nothing

nothing but the effects of the too long protracted use of resolvents and evacuants, the natural inference is, that such remedies are by no means calculated to remove the disease, but that the medicines indicated here are tonics; such as astringents, bitters, bark, steel, alum, snake-root, and wine, by the use of which the foulness of the tongue, the depraved taste in the mouth, the sense and weight of fulness in the stomach, gradually disappear, the appetite returns, and the patient's health is perfectly restored.

It appears therefore, that when sordes of the primæ viæ appear, the practitioner should by no means have recourse in all cases to evacuants and resolvents, but ought carefully to distinguish, whether the sordes of the primæ viæ be the cause of the fever; or, on the contrary, owing to it's morbid action on the system, or even the effects of the too long use of resolvents and evacuants. In the former case aperients and evacuants should be exhibited; whereas in the latter, to clear the primæ viæ, nothing proves so powerful as a free use of tonics and wine.

If the gastric fever should prove mortal, which, if the disease have been properly treated in it's commencement, will seldom be the case, life is destroyed in three ways.

1, The bad bile produces dreadful disorders in the animal economy, and a continual vomiting and diarrhœa take place, by which the vital powers are materially weakened, and, if a stop be not quickly put to it's action, the patient is carried off by the violence of it.

2, The acrid bile may excite ſpurious inflammations of the viſcera, ſoon running into gangrene; in which caſe, the patient dies from a mortification of the bowels.

3, The bilious matter is ſometimes transferred by metaſtaſis to the vital organs, eſpecially to the brain and lungs, and produces an apoplexy or peripneumony, which frequently terminates fatally.

The nervous fever has been named the ſlow fever, as in it's commencement it ſeems to be a mere debility of the nervous ſyſtem, and the diſeaſe therefore may be protracted during a longer time, than either the gaſtric, putrid, or inflammatory fever uſually continues. The ſymptoms of debility are the moſt prevalent: there are a great laſſitude and wearineſs over the whole body; a pale and deſponding countenance; ſighing; amazing anxiety and dejection of ſpirits, the patient ſometimes even fears to ſhut his eyes through dread of dying; loſs of appetite; watchfulneſs; difficulty of reſpiration; alternate chilliness, with fluſhing, ſo that the cheeks often appear florid, while the noſe and ears are cold, and the forehead in a clammy ſweat; giddineſs, and pain in the head; a great ſenſibility to light and noiſe; the tongue is moiſt with a white mucus on it, and ſometimes a brown or yellowiſh liſt running along the middle; there is an oppreſſion on the precordia, with nauſea, and vomiting of an inſipid pituitous matter; the pulſe is frequent, quick, weak, irregular, and often intermittent, with little heat or thirſt; and the urine is pale and limpid. All the complaints generally increaſe towards night.

In

In a few days after, the pain and heavineſs in the head become very diſtreſſing and ſevere; there is a coldneſs of the extremities, a tinnitus aurium, ſlight delirium without fury; the voice of the patient becomes hoarſe, and ſometimes the power of ſpeech is loſt altogether; the tongue grows dry, red, and chapped; the patient, from being very irritable, becomes ſtupid, and inſenſible to external objects; the celebrated Dr. Tiſſot records inſtances, where all the five ſenſes have been loſt, and yet the patient recovered; coma, tremor of the tongue, with ſubſultus tendinum, proſtration of ſtrength, fainting on ſitting in an erect poſture, clammy ſweats, involuntary diſcharges by urine and ſtool, and convulſions come on, and death cloſes the ſcene.

The prognoſis of the diſeaſe depends on the ſymptoms. The favourable ſigns are a moiſt tongue, early diſpoſition to ſalivation, a gentle moiſture on the ſkin, ſcabby eruptions about the noſe and mouth, tumours of the parotid glands, a moderate diarrhœa, deafneſs, and a more regular pulſe. The dangerous ſymptoms are extreme debility, tremulous motions of the tongue, lips, and hands; ſubſultus tendinum; coma; laborious reſpiration; a low, quick, fluttering, pulſe; miliary eruptions; partial ſweating about the breaſt and forehead, with cold extremities, when the nails, the lips, and the tip of the noſe become pale or livid. If confluent aphthæ of a brown or black colour appear, with impeded deglutition; if profuſe clammy ſweats break forth, and cover the whole ſurface; if the ſtools be looſe, watery, fetid, and frequent; if the fœces, urine, and tears go off involuntarily; if a hiccup come

come on; if the patient become quite inſenſible, and cannot be raiſed by powerful external ſtimuli; and if general convulſions ſhould appear; a fatal termination of the diſeaſe is to be expected.

This diſeaſe has no regular criſis. About the ſeventh or eighth day after the patient has been confined to his bed the ſymptoms increaſe; if it prove fatal, the patient generally dies on or before the fourteenth day; life is uſually preſerved after the twentieth day of the diſeaſe.

In the cure of this diſorder all ſtrong evacuations ſhould carefully be avoided, and the *vis vitæ* is to be ſupported by tonics and ſtimulants during the whole courſe of the diſeaſe. In the beginning of this fever it is adviſable to give a gentle emetic in order to clear the ſtomach, procure ſtools, open the pores of the ſkin, and ſtimulate the nervous ſyſtem by the ſhock it gives to the whole body. Purgatives are of no uſe at all. To keep the body ſoluble, a few grains of rhubarb and magnes., or ſal. polychr., are ſufficient; or, it may be done by throwing up emollient clyſters from time to time. A gentle moiſture on the ſkin may be excited by the ſpiritus Mindereri, Dover's powder, or camphor diſſolved in vinegar and given in a ſmall doſe; but the chief cure is to be performed by tonics, and ſtimulants. Wine is one of the chief cordials, and perhaps the moſt powerful in this diſeaſe: it ought to be a good ſtrong wine ſuch as port wine, or madeira; and the patient may uſually be indulged with a conſiderable quantity; for it allays the delirium, procures a ſound ſleep, renders the pulſe ſlower and fuller, and ſupports the *vis vitæ* under the profuſe ſweats, the colliquative

colliquative diarrhœa, and the cuticular eruptions. It has been given with ſucceſs to the quantity of ſome quarts in the courſe of twenty-four hours, without the patient's experiencing the leaſt ebriety, in caſes where the pulſe was ſoft, low, and quick, and the patient was in a comatoſe delirium, and appeared to be inſenſible to external objects. The wine is to be given in divided draughts every hour, and the doſes ſhould be regulated according to the degree of debility of the ſyſtem.

Next to wine bliſters may be ranked; which may be applied with great advantage during the whole courſe of the diſeaſe. The moſt benefit, however, is to be derived from them in the commencement of the diſeaſe, before the patient is yet confined in bed; and afterwards, when the irritability of the patient is changed into inſenſibility, they ſhould be applied to the extremities, where the view is only to ſupport the vis vitæ: when the intention is to relieve the pain and uneaſineſs within the head, behind the ears, or on both temples, are the moſt convenient places; if the head ſhould be affected with ſtupor and coma, they are to be laid on the neck, and this being inſufficient, the head ſhould be ſhaved, and a bliſter applied to the head itſelf, from which I have ſeen the moſt ſtriking effects. Pediluvia three or four times a day aſſiſt their operation materially in relieving the head. The mild diaphoretic remedies of the cordial kind, ſuch as the ſerpentaria and contrayerva, are found powerful, and ſhould be given throughout the diſeaſe. In caſes where the patient becomes affected with drowſineſs, and is ſtupid, and inſenſible to external

impreſſions, muſtard whey may be adminiſtered, and particularly aſafœtida, and the flowers of the leopard's bane given in a decoction or infuſion from ʒſs to ʒſs to ii ℔ of water. This laſt remedy the celebrated Dr. Stoll has frequently given with the beſt ſucceſs, and I have ſeen ſome patients ſnatched from the jaws of death by it's uſe; but it is beſt to combine it with chamomile flowers, in order to prevent it's violent action on the ſtomach. The ſubſultus tendinum, tremulous motions of the extremities, and delirium, with a ſmall, quick, and hard pulſe, are beſt relieved by muſk, given from gr. x to ʒi, every half hour, hour, or two, or three, hours; and ſmall doſes of opiates may be uſefully joined with it, for by theſe means a quiet ſleep is often procured to the patient. The ſighing, the dejection, and terrour of mind, are beſt removed by ſp. c. c., ammonia, caſtor, and valerian. In caſes of reſtleſſneſs, with or without delirium, the fomenting of the extremities with vinegar and water, and the laud. liq. Syd. given from ten to twenty drops, will often procure both ſleep and perſpiration. In colliquative ſymptomatic diarrhœa ſmall doſes of rhubarb with ipecacuanha, or with the extract. caſcarillæ, the terra catechu, Dover's powder, the tinct. thebaica in ſmall doſes, alum whey, the bark, the radix arnicæ, ſalep, gum arabic, the decoct. alb. Syd., fomentations of wine applied to the abdomen, and glyſters of bark, chamomile, and opium, are the moſt efficacious means to put a ſtop to the looſe watery ſtools. The colliquative ſweats are beſt moderated by the plentiful uſe of wine, by a vinous infuſion of ſage, by ſmall doſes of opiates, by the bark, and by a mixture of equal parts of the ſpiritus vitrioli and alkohol,

alkohol, given from twelve to thirty drops every one or two hours.

As ſoon as the violence of the diſeaſe has been abated by the above remedies, and the fever begins to be of the remittent kind, recourſe ſhould be had to the bark. As the patient's ſtomach does not uſually bear it in ſubſtance, it's infuſion in wine is to be given, to which the tincture, and ſnake root may be uſefully added; and it is to be obſerved, that, in the cure of this diſeaſe, next to wine, the cinchona is the chief medicine; for it ſupports the *vis vitæ*, prevents metaſtaſis, removes the aphthæ, and cures the clammy ſweats. The diet of the patient, during and after the diſeaſe, ought to be of the nouriſhing kind: chicken-broth, beef-tea, veal, fowls, ſago, ſalep, chocolate, jellies, beef and mutton broth, in conjunction with country air, moderate exerciſe, and the uſe of milk. It is however to be obſerved, that, as all food is only nutritious as far as it is properly digeſted, and the organs of digeſtion are but weak in this diſeaſe, the food and drink ſhould be taken often, in ſmall quantities at a time, becauſe the weak ſtomach cannot bear a great deal at once.

If the nervous fever prove fatal, it may deſtroy life in ſix different ways:

1. The vital powers become daily more and more weakened, and fainting, and cold ſweats appear on the ſlighteſt motions; the vigour of the ſolids is diminiſhed every day, till the ſpark of life at length

 gives

gives way to the morbid ſtimulus, and the patient gently expires.

2. The patient is not unfrequently carried off by an apoplectic fit, on account of a fatal tranſlation of the diſeaſe to the head.

3. Sometimes ſuffocation takes place, a tranſlation happening to the lungs.

4. The morbid ſtimulus chiefly attacking the primæ viæ produces a colliquative diarrhœa, by which the vital powers being entirely broken, the patient is deſtroyed. In this caſe life is extinguiſhed by the depraved action of one or two organs requiſite to the ſupport of the vital principle.

5. Profuſe clammy ſweats often cover the whole body, which having deprived the ſyſtem of all it's remaining energy, death is uſhered in.

6. The ſolids, collecting for the laſt time all their powers, excite general convulſions, by which the thread of life is ſnapped aſunder.

The putrid fever may be defined to be a languor of the whole habit, but more eſpecially of the vaſcular ſyſtem; for on account of the great debility of this ſyſtem, evident ſigns of a tendency of the blood to diſſolution take place. The ſymptoms are intenſe burning heat, alternating with chilline ſs; extreme and ſudden proſtration of ſtrength, attended with a great deſpondency of mind; loſs of appetite; oppreſſion at the præcordia; nauſea, and vomiting,

vomiting; a pulſe ſometimes in the beginning hard, ſmall, and frequent, but always ſoon becoming weak, ſoft, quick, and unequal, and frequently intermitting; anxious reſpiration, attended with frequent ſighing; fœtid breath; the tongue foul, ſometimes dry, chapped, and of a black colour, with ſordes about the teeth; generally great thirſt, but when the diſeaſe takes on a more malignant form, there is no thirſt at all; uneaſineſs within the head; a yellowiſh caſt of the eyes, which ſometimes appear full, heavy, and ſomewhat inflamed; univerſal pain; pulſation of the carotid and temporal arteries; if the patients do ſleep at all, they are not refreſhed by it; but in general there is great watchfulneſs, tinnitus aurium, delirium, coma, ſubſultus tendinum; looſe, offenſive ſtools; viſcid fetid ſweats; urine likewiſe in general fetid, and high coloured, but ſometimes pale; hemorrhages from the noſe, and other parts; univerſal livid and petechial eruptions; numerous and dark coloured aphthæ; and hiccup.

It is however not to be expected, that the ſame ſymptoms will always be met with in this fever; for this diſeaſe aſſumes a great variety of appearances. In general it is ſeldom ſimple, but moſtly complicated with a morbid condition of the primæ viæ; ſometimes in the beginning it puts on the appearance of an inflammatory fever; the pulſe is hard, full, and quick; there is rigor, head-ach, and an apparent increaſed action; more frequently it is complicated with the nervous fever, to which now and then a catarrhal affection of the body accedes: in

theſe caſes the fever is of the mixed kind, and named putrid nervous, or malignant catarrhal fever.

The prognoſis of this diſeaſe differs according to the different ſymptoms obſerved. The favourable ſigns are ſcabby eruptions about the noſe and lips; deafneſs, when it comes on in the decline of the diſeaſe; the eruptions becoming red, and inflamed; a moderate diarrhœa, attended with relief of the head; a ſoft, moiſt ſkin, with gentle warm ſweats; concocted urine, with a whitiſh ſediment; a more ſtrong and equal pulſe; free reſpiration; and return of the ſenſes. The dangerous are when the patient is ſcarcely able to ſupport himſelf for a moment in the ſame poſition, on account of the extreme debility of the body; a great deſpondency and dejection of mind; or, what is ſtill worſe, an uncommon degree of inſenſibility, and want of apprehenſion; a dry, black, and chapped tongue; numerous black aphthæ; livid petechial eruptions; a chewing motion of the jaw; a conſtant fumbling with the hands; plucking the bed clothes; tremulous motions of the tongue and lower lip; difficult reſpiration; no thirſt; partial clammy ſweats; tenſion of the abdomen, with looſe fetid ſtools; cold extremities; delirium; ſtupor; hiccup; a very quick, fluttering, weak, irregular, and intermittent pulſe; and the involuntary diſcharge of the urine and fœces.

With reſpect to the treatment of this diſeaſe, in caſes where a congeſtion of the blood towards the head takes place, the pulſe is tenſe, and there is a tendency to inflammation, it may be proper, that the

the head ſhould be relieved by the application of leeches, or cupping glaſſes, or by the taking away a few ounces of blood from the jugular vein; but it is to be obſerved, that bleeding here is indicated only to remove the accumulation of blood in a vital organ; but that veneſection is by no means capable of taking away the morbid cauſe, for the removal of which a treatment oppoſite to the antiphlogiſtic regimen is requiſite. This operation ſhould therefore be managed with the greateſt caution; for, after a copious bleeding, the pulſe often ſinks ſo low, that it can never be raiſed again; and, at the ſame time that we take away blood from the head, the vis vitæ of the general ſyſtem ſhould be ſupported by the uſe of tonics and ſtimulants. The putrid fever is uſually attended with ſordes in the primæ viæ, theſe are to be cleanſed by an early uſe of emetics and purgatives, which laſt ſhould be of the neutral and aceſcent kind, eſpecially in caſes where the hypochondria are tenſe, and there is a great determination to the bowels. The alimentary canal being thus cleanſed, recourſe is to be had to the uſe of tonics and ſtimulants. A plentiful uſe of rheniſh wine ſhould be recommended to the patient, in order to counteract the tendency of the blood to diſſolution by ſtimulating the vis vitæ. The bark ſhould likewiſe be given in the largeſt doſes, without waiting for either intermiſſion or remiſſion; for if the practitioner carefully wait till there are diſtinct remiſſions, he will frequently loſe the opportunity of ſaving the patient's life. The cinchona in ſubſtance would no doubt anſwer the purpoſe beſt, but as the weak ſtate of the ſtomach can but rarely bear it, a very ſtrong decoction of the

bark ſhould be given, which, in caſes of urgency, may be made more powerful by mixing in it ſome fine powdered bark, and by the addition of it's extract, and tincture. In caſes of ſimple putrid fever, the vitriolic acid ſhould be given along with the bark; whereas, where the tendency to putrefaction is not ſo extreme, and the fever partakes of the nervous character, the vegetable acids are preferable to the foſſile ones. If the bark ſhould bring on coſtiveneſs, evacuations ſhould be procured by adding ſmall doſes of rhubarb to it; or, what is much better, by gentle laxatives and emollient glyſters, which, beſide diluting the noxious matter contained in the large inteſtines, often prevent the griping and ſwelling of the belly from taking place. If the bark occaſion a diarrhœa, this is to be ſtopped by the addition of terra catechu, ſalep, and ſmall doſes of opiates: when the contents of the ſtomach ſhould be continually thrown up again by violent vomiting; the ſame remedies we have ſpoken of in the nervous fever on this ſubject are uſeful here likewiſe. Profuſe ſymptomatic ſweatings are obviated by infuſion of ſage, by a free uſe of wine, by a mixture of equal parts of alkohol and vitriolic acid, by the bark combined with alum and the foſſile acids, and by taking the patient out of the bed, and expoſing him to cold air. Symptomatic colliquative diarrhœa may be moderated by the uſe of opiates, by wine and bark, by alum whey, and by the root of the leopard's bane.

The food ſhould be vegetable, aceſcent, and of the eaſieſt digeſtion; the drink ought likewiſe to be acidulated; the air of the patient's room ſhould be kept

kept as pure, and well ventilated, as poſſible. To prevent a relapſe, the habit is to be ſtrengthened by light and eaſy digeſtible food; by gentle exerciſe on horſeback; by the uſe of bitters, aromatics, wine, and chalybeate waters.

In the cure of this diſeaſe I have not ſpoken of keeping up a gentle diaphoreſis by the addition of ſmall doſes of emetic tartar to the bark, which has been recommended by ſome practitioners; for the diaphoreſis is only of uſe in as far as it ſometimes proves a criſis of the diſeaſe. The criſis, we know, is brought about by the *vis naturæ medicatrix*; and the morbid matter is expelled the body by different emunctories in different caſes: it is much better, therefore, to ſupport the *vis vitæ* by the due uſe of tonics and ſtimulants, and to leave to nature the choice of the emunctory for the expulſion of the morbid matter. In caſes where there is a determination to the ſkin, this may be encouraged, by giving the ſp. Mind., the ſp. nitr. dulc., or any other gentle diaphoretic, along with it; but the practice of combining ſmall doſes of emetic tartar with the bark ought to be laid aſide, for from what I have ſeen, I am perfectly ſatisfied, that it weakens the tonic power of the bark, and often does a great deal of harm.

But though theſe remedies ſeldom fail to effect a cure, when proper attention has been paid to the diſeaſe in the beginning, yet when the fever has been ill managed, or the putrid diſeaſe is complicated either with a catarrhal diſpoſition of the body, or with the nervous fever, or with them both, it puts on a more dreadful appearance, and deſerves juſtly the name of malignant fever. Here the *vis naturæ medicatrix* being

being incapable of reſiſting the violent action of the morbid ſtimulus, the whole ſyſtem appears to be extremely relaxed; the patient is unable to ſupport himſelf in one poſition for a ſingle moment; the ſlighteſt motion of the body occaſions a fainting; the pulſe is weak, fluttering, and intermittent; the reſpiration is anxious and difficult; the tip of the noſe, the lips, and the nails, aſſume a black colour; the tongue is likewiſe blackiſh; deglutition is impeded; the extremities are cold; clammy cold ſweats, coma, inſenſibility to external objects, convulſions, and ſubſultus tendinum appear. In theſe caſes, the cinchona and wine, though they are the moſt powerful tonics and cordials to procure a permanent ſtimulus, and to ſtrengthen the habit, have not ſtimulating powers enough to rouſe the vital principle into action; but recourſe is to be had to the high diffuſible ſtimuli, ſuch as camphor, ammonia, muſk, aſafœtida, valerian, caſtor, ſerpentaria, contrayerva, glyſters of the cinchona with camphor, bliſters, fomenting the body with cold water and vinegar, and taking the patient during the height of the fever out of his bed, and carrying him into the open air; a remedy the uſe of which, even in the moſt urgent circumſtances, has been proved beyond all doubt, by the numerous obſervations of the celebrated Dr. Lettſom on this ſubject. As the nature of the remedies recommended clearly ſhows, that they are not to be uſed indiſcriminately, and that the ſtimulus of the medicine exhibited ſhould be ſuited to the condition of the patient, we will attempt to point out under what circumſtances the above remedies may be advantageouſly uſed.

If

If the pulſe be ſmall, weak, ſoft, and equal; if the extremities be cold; if the patient lie in a comatoſe ſtate; if there be an inſenſibility to external objects, a want of apprehenſion, and an extreme weakneſs of the ſyſtem; camphor, given from a ʒß to ʒii in the twenty-four hours, the ſerpentaria, the contrayerva, wine, and arnica are to be exhibited. But it ought to be obſerved, that the doſe of the remedies ought to vary according to the circumſtances: particularly practitioners ought to be cautious in the uſe of camphor; for if the excitement be unluckily carried too far, congeſtion of the blood towards the head, redneſs of the face, convulſions, and mortal phrenſy, are not unfrequently the conſequences; it is therefore the ſafeſt way to begin with ſmall doſes, from three to ſix grains, in order to ſee how the patient bears it, in caſes where the ſymptoms are not very urgent.

In caſes where the action of ſwallowing is impeded, repeated glyſters of a very ſtrong decoction of the bark combined with camphor; the wrapping up of the body in ſheets dipped in ſpirits of wine, vinegar, and water; the expoſition of the patient to cold air; and the free uſe of bliſters, now and then ſave life.

If the pulſe be ſoft, fluttering, unequal, and intermittent, camphor ſhould not be given; but volatile alkali, caſtor, the ſp. c. c., aſafœtida, and valerian, are moſt likely to prove beneficial. Laſtly, if the ſkin be hot and dry; if the urine be pale; if the muſcles of the face be thrown into convulſive motions; if there be ſubſultus tendinum, and a ſmall, weak, and ſomewhat hard pulſe; muſk is the only

only remedy in which we can truſt. It is true, that ſome practitioners aſſert, they have found no benefit from muſk, but the numerous obſervations of Quarin, Vogel, and other celebrated phyſicians, put the efficacy of this remedy beyond all doubt: and from what I have been able to obſerve myſelf, I am perfectly ſatisfied, that the inefficacy of the muſk in the hands of ſome practitioners has been owing either to it's being adulterated, it's not being given in due doſes, or it's being uſed under circumſtances, in which recourſe ſhould not have been had to it. For as the quantity in which it ſhould be given, and the intervals between the different doſes, are carefully to be ſuited to the ſtate of the patient, it ſhould be exhibited from five grains to ℈i, and repeated from every half hour to every three hours, according to the greater or leſs urgency of the ſymptoms.

Though bliſters are of no uſe in the beginning of the diſeaſe, yet, when the fever puts on a more alarming appearance, or is complicated with the nervous fever, in order to ſupport the *vis vitæ*, and to rouſe the vital principle into action, they are freely to be applied, and are often ſucceeded by happy effects. The place of their application ſhould be the extremities, the temples, behind the ears, at the neck, and on the head itſelf, according to circumſtances.

As ſoon as by means of the high diffuſible ſtimuli, the *vis naturæ medicatrix* has been ſufficiently excited, the ſtimulants of this kind, at leaſt of the animal and mineral kingdoms, are to be laid aſide; for if they were longer continued, they would often

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do a great deal of harm; they have all done what is to be expected from them, by removing the irregular convulsive motions, and supporting the *vis vitæ*; their stimulus, though powerfully operating on the system, yet is but a temporary one; they afford but a transitory excitement of the vital principle, and are incapable of giving a permanent strength to the patient; they ought therefore to be changed for the use of wine, bark, serpentaria, and alum, the most powerful remedies we possess for strengthening the habit.

If the putrid fever prove fatal, life is destroyed in three ways:

1. The vital principle, being extremely weakened by the violence of the noxious power, becomes at length wholly abolished by the continuance of the morbid action.

2. The putrid fever is frequently attended with spurious inflammations of the primæ viæ, quickly running into gangrene; in which case the patients are carried off by a mortification of the stomach and bowels.

3. The morbid matter is not unfrequently deposited by metastasis on the vital organs, especially on the brain, and lungs, in which cases the patient is either suffocated, or dies from an apoplectic fit.

The fevers of which we have hitherto spoken, though different as to their degree of violence, and operating on different organs, all agree in this, that they originate in the debility of the system.

But though the fever moſtly depends on a weakened ſtate of the body, yet an increaſed action of the ſyſtem, under ſome circumſtances, likewiſe produces fever, which has been called

The ſimple continued and inflammatory fever. This diſeaſe is attended with the following ſymptoms: a ſenſe of laſſitude and debility; pain univerſally felt in the bones, but more ſeverely in the ſhoulders, back, knees, and head; an intenſe heat, with redneſs of the ſkin, eſpecially of the eyes and face, preceded by rigor, dryneſs of the tongue, mouth, and fauces; unuſual thirſt; coſtiveneſs; dry ſkin; high coloured urine, voided in a ſmall quantity; frequent, full, and ſtrong pulſe; though ſometimes ſmall, and hard; quick and laborious reſpiration; great uneaſineſs, and anxiety; reſtleſſneſs; and delirium.

The prognoſis of this diſeaſe ſhould be taken from the degree of violence of the morbid ſtimulus, and the ſtrength of the patient. The favourable ſymptoms are, a free reſpiration, an equal, ſoft, full, and leſs frequent pulſe; a copious ſediment in the urine; moiſtneſs of the tongue; ſoftneſs of the ſkin, with moderate heat; moderate general ſweats; ſlight diarrhœa; a plentiful hemorrhage from the noſe; and the returning of the patient's ſenſes. On the contrary, an unfavourable termination is to be expected, when the pulſe is very quick, weak, and hard; the reſpiration frequent, and anxious; the delirium permanent, with great watchfulneſs; the extremities cold; the urine of a livid or black colour; when a few drops of blood ooze out from the noſe; when there are an hemoptoe, a ſenſe of ſuffocation without ſwelling of the throat; frequent,

quent, looſe and offenſive ſtools; profuſe colliquative ſweats; convulſions, and involuntary evacuations.

The cure of the inflammatory fever conſiſts in lowering the increaſed action of the ſyſtem by bleeding, evacuating the primæ viæ, and determining to the ſkin by ſmall doſes of antimonial preparations, ſp. Minderi, &c.; by a plentiful uſe of diluents and acefcent drinks, and by a low, ſpare, and vegetable diet.

In caſes where there is local pain and congeſtion of blood, the application of ſome leeches, and the uſe of bliſters, will relieve the complaint. The bleeding ſhould be proportioned to the ſtate of the pulſe, the temperament and ſtrength of the patient, and the violence of the ſymptoms. The quantity of blood that is uſually drawn from the patient is from ten to eighteen ounces. In caſes where the inflammatory ſtate of the body is ſtrongly marked, and the patient is of a ſtrong full habit, it is much better, for moderating the violent action, to take away at once fourteen or eighteen ounces of blood, than to draw off even double the quantity at different intervals. Even a ſmall hard pulſe, with an apparent debility of the ſyſtem, does not forbid bleeding, if the other ſymptoms indicate it; as the oppreſſed pulſe riſes upon the uſe of the lancet. But as in theſe caſes it is often difficult a priori to determine, whether bleeding be requiſite or not, the phyſician ſhould here always be preſent at the operation, in order to know what effect it has upon the pulſe; for if he had unluckily miſtaken a weak

pulſe

pulſe for a ſmall and oppreſſed one, the conſequence of a copious bleeding would be the degenerating of the diſeaſe into a putrid fever; which is by no means an unfrequent occurrence, in conſequence of the antiphlogiſtic treatment being carried too far. If the inflammatory ſymptoms do not give way on the firſt bleeding, it ſhould be repeated as often as the ſymptoms require it; and though it is beſt to take away the requiſite quantity of blood as early as poſſible, yet after the fourth or fifth day bleeding may be proper.

But it is to be obſerved, that, though ſometimes the diſeaſe does not yield except to repeated bleedings, in general one or at moſt two veneſections, in conjunction with other remedies, will prove quite ſufficient to reduce the increaſed action; nay, that in many caſes, on account of the action being but little increaſed, and the delicate habit of the patient, the quantity of blood taken away ought not to exceed from ſix to ten ounces. As ſordes of the primæ viæ are often joined with the inflammatory diſpoſition, recourſe ſhould be had to vomits, if the ſtomach be affected. At the ſame time the ſyſtem is to be lowered, and the bowels kept clear, by the neutral ſalts, cream of tartar, nitre, manna, caſſia, and tamarinds; and a determination to the ſkin may be kept up by adding to the neutral ſalts ſmall doſes of emetic tartar. But much of the cure conſiſts in giving the patient plentifully to drink of diluents, and aceſcent liquors, ſuch as cooling juleps, with cream of tartar, nitre, ſimple oxymel, acid of tartar or ſp. vitrioli, lemonade, &c. The diet ſhould be a ſpare vegetable one, and the room

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in which the patient lies, ſhould be large and airy, and kept cool.

The ſimple continued fever, or ſynocha, does not differ from the inflammatory but in degree. It ſeldom requires bleeding, except in full plethoric habits; but is uſually ſubdued by evacuating the primæ viæ by eccoprotics; by encouraging a gentle diaphoreſis; by joining ſmall doſes of the antimonial preparations with the purgatives; and by diluent aceſcent drinks, taken in a large quantity.

When treating on the putrid fever, I obſerved, that the diſeaſe ſometimes in the beginning puts on an inflammatory appearance; but that, if the phyſician treat it as an inflammatory fever, the pulſe will ſink very often conſiderably, and the patient not unfrequently fall a victim to ſuch a treatment. In order to avoid any miſtake of this kind, in doubtful caſes the blood ſhould be drawn but in ſmall quantity, and the phyſician ſhould always carefully attend to the character of the prevailing epidemic, the habit of the patient, his manner of living, and the place of his reſidence; for in the country, where the people generally live more in conformity to the laws of nature, diſeaſes partake much more of the inflammatory character, than in large towns; where the air corrupted by the great number of people crowded together, the luxuries of the table, the indulging in tepid drinks, and the numerous ladies of the town, take pretty good care, that the fevers the phyſician has to cure are generally of the low kind; at leaſt have but ſeldom ſo much of the in-

flammatory caſt, as to require repeated bleeding, to moderate the increaſed action of the ſyſtem.

If the inflammatory fever terminate fatally, the patient may die in four different ways.

1. The vital principle is extinguiſhed by the violent operation of the morbid ſtimulus; in which caſe the patient ſometimes expires under the laſt efforts of the *vis vitæ*, that is amid convulſive motions; or, which is more frequent, he is deſtroyed by the extreme relaxation and atony of the body, the natural conſequences of the too great irritation of the ſyſtem.

2. A metaſtaſis of the morbid matter, it being depoſited on ſome internal organ, occaſions death.

3. Sometimes the patient is carried off by a large ſecretion of coagulable lymph, which prevents the viſcera from performing their uſual office.

4. But the diſeaſe moſtly kills by inducing inflammation and gangrene of internal parts.

All the idiopathic fevers, though numerous diſtinctions and diviſions have been made of them by the different writers on the ſubject, may be reduced to one or other of the kinds of which I have ſpoken. I cannot, however, here forbear to ſay a few words on the catarrhal fever, though it is not an idiopathic diſeaſe, but a ſymptom of the catarrh: and the leſs, as, according to the bills of mortality, ſo many patients are yearly carried off by this fever.

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The fact is, that the ſimple and true catarrhal fever is a mild diſorder, and, when properly treated, is always unattended with danger; though it's neglect may give riſe to peripneumony, and even to phthiſis itſelf, and thus ultimately deſtroy the patient; yet the diſeaſe never immediately leads to death.

But this catarrhal fever, being differently modified by the character of the prevailing epidemic, is often joined with a bilious, putrid, nervous, and inflammatory diſpoſition of the body; and, being thus complicated, frequently deſtroys the life of the patient.

The ſimple catarrhal fever is known by an uneaſineſs within the head, watery inflamed eyes, a defluxion of ſharp tears, deafneſs, tinnitus aurium, and a diſcharge of ſerous humour from the noſtrils, which on account of it's ſharpneſs occaſions frequent ſneezing. The treatment conſiſts in avoiding cold, living chiefly on vegetables, keeping the body open by gentle eccoprotics, making uſe of cooling aceſcent drinks, and gentle diaphoretics; to which this ſlight diſorder readily gives way.

With reſpect to the ſymptoms, prognoſis, treatment, and manners of killing of the catarrhal fever, when in it's complicated ſtate; the diſeaſe puts on ſuch a variety of appearances, according to the different morbid condition with which it is complicated, that no general rules can be laid down with regard to them. The treatment ſhould altogether depend on the character of the prevailing epidemic

and the habit of the patient; the practitioner will however never be at a loſs, in any complication whatever of the catarrhal fever, if he be well acquainted with the general principles of phyſic, and know how to treat the bilious, putrid, nervous, and inflammatory fevers.

Thus we ſee, that fevers, though aſſuming different forms, and attacking the ſyſtem with different degrees of violence, yet all originate either from increaſed action; or, which is much more frequently the caſe, from a debilitated ſtate of the ſyſtem. To the former belong the true inflammatory fever; the catarrhal inflammatory one, and ſome vernal intermittents; which now and then partake of an inflammatory character; in all which caſes, the antiphlogiſtic treatment, in a greater or leſs degree, is to be purſued. The intermitting, the bilious, the putrid, and nervous fever, are all owing to the latter; and are to be cured by having recourſe to the tonic ſtimulating plan. It was however neceſſary, to take a particular view of each of them; as the ſtimulus of the medicine to be uſed ought to be ſuited to the different degree of the weakneſs of the ſyſtem.

ORDER II.

Febrile Diſeaſes.

THESE diſeaſes form a conſiderable part of the acute diſtempers, eſpecially ſince the doctrine of the *exanthemata* has been ſo much improved by the moderns;

moderns; though it is greatly to be regretted, that authors do not better agree in determining the different kinds of *exanthemata*, and that one makes uſe of this diviſion, another of that, ſo that no two authors are found, who do not diſſent upon this matter in one point or other. Dr. Stoll admits no other primary *exanthemata* than the ſmall-pox and the meaſles, and thinks that all the reſt are always ſymptomatic. It is foreign to the deſign of this work to treat ſeparately of each of the *exanthemata*; and the more as there exiſts a great analogy among them all, eſpecially with regard to their treatment and general cauſes of death; therefore I ſhall ſpeak of all the exanthematous diſeaſes together, ſo that having premiſed a general view of them, I ſhall inquire into the queſtion, whether the *exanthemata* be fatal of themſelves, or not; which being determined, I ſhall endeavour to ſhow in how many ways they may prove mortal to mankind.

As to the firſt, the *exanthemata* are commonly divided into puſtulous, and maculous, the former are the ſmall-pox, the miliary fever, the nettle raſh, and the plague: the meaſles, the ſcarlet fever, the petechial fever, and the eryſipelas are enumerated among the latter. This diviſion however is not founded on the obſervation of nature; as ſome *exanthemata*, which commonly preſent themſelves in the form of maculæ, exhibit ſometimes puſtules, or veſicles inſtead of them. This is proved not only by the veſicular eryſipelas, but likewiſe by the meaſles, which, though producing ſmall puſtules in the face, exhibit maculæ in the other parts of the body;

thus clearly proving, that there exists no essential difference between the maculous and the pustulous eruptions. Besides, the observations of physicians on the variolous fever without the small-pox evidently show, that the contagion of the small-pox may be eliminated out of the body without any pustules making their appearance on the surface*; so that, when the inoculation of the small-pox is performed, if only the due change of the wound, together with a fever, and the other characteristics of the small-pox, happen in the usual time, we may be certain, that the patient has really had the small-pox. The same is to be said of the pestilential contagion, which, according to the testimony of the learned Orræus, is likewise in it's commencement not unfrequently carried off by the insensible perspiration †. Therefore it is evident, that neither maculæ, nor pustules constitute the essential character of an *exanthematous* disorder, but that it is only requisite to it, that the contagion be deposited at the surface of the body, and, having there undergone a certain process by means of the cuticular vessels, be at length carried off by insensible perspiration, like an excrementitious matter.

Thus it seems highly probable, that any contagion whatever being taken up into the system and mixed with the blood, the vital powers, as in many

* Sydenham *Opera omnia*, sect. 3, cap. 3, p. 162: Ludwig, l. l, part 1, cap. i, subsect. vii, p. 79: and Burserius, l. l. vol. ii, pt. 1, cap. ix, p. 322,

† Vogel, l. l, ii theil, kapitel ii, p. 162: and Orræus *de Peste, quæ Anno* 1770 in *Jassia*, et 1771 *in Moscua grassata est Experientiæ* 17, *Petropoli* 1784, p. 81, 4to.

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other cafes, depofit the morbid matter by a certain inexplicable affinity, as it were, either at the furface of the body or at the glands, the latter of which is frequently the cafe in the plague: the morbid matter being there depofited, when not difcharged by the infenfible perfpiration, continually ftimulates the veffels, with fuch effect, that their ftructure is changed; the veffels, thus altered in their manner of acting, react upon the morbid ftimulus, change the contagious matter, and, at length fecern a fubftance very different, according to the different contagion, and the various ftate of the health of the fubject, and exhibiting maculæ, puftules, or impofthumes, according to the various circumftances, for the fecretion, like all the other vital powers, is always in the compound ratio of the ftructure of the fecerning organs, and the ftimulus applied.

All the phenomena, with which the *exanthemata* are attended, ftrongly corroborate my opinion, as Nature follows the fame laws, both in the fmall pox and in the other *exanthemata*, as in all the other fecretions: for not to mention, that the fmall pox is indeed nothing, but fmall abfceffes produced by the variolous contagion, and fpread over the furface of the body: if, for inftance, the inflammatory ftate be too violent in the fmall pox, the inflamed fmall pox cannot pafs on to a fuppuration, before the tone of the veffels is lowered by bleeding; whereas, if the degree of vital power requifite to a good fuppuration be wanting, an acrid humour is fecerned inftead of a mild purulent matter, which taking various forms, according to the different degenerated actions of the folids, gives rife to the ichorous,

lymphatic, and bloody or gangrenous ſmall pox; for what elſe are theſe ſpecies of malignant ſmall pox, than ſo many depraved manners of acting of the ſecretory organs? Hence, if we can ſuccour the vital principle by means of powerful ſtimuli in ſuch caſes, a good purulent matter will often be quickly ſecerned inſtead of a depraved humour; which evidently ſhows, that the condition of the matter in exanthematous diſeaſes depends ſolely, as well as all the other ſecretions, upon the action of the veſſels.

As to the ſecond, the exanthematous diſorders being thus generally noticed, I muſt next inquire into the queſtion, whether they bring on death of themſelves. In anſwer to this queſtion, I ſay, that I am of opinion, that all the exanthematous eruptions are to be looked upon as diſeaſes, if not mild, at leaſt not dangerous; but that their contagions are not unfrequently modified both by the complication of the epidemic conſtitution, and by various other accidental circumſtances, in ſuch a manner, that they prove very fatal, and make great ravages among mankind. As I doubt not, but ſuch an anſwer will ſeem queſtionable to moſt phyſicians, I will explain the reaſons, which have induced me to embrace this opinion, leaving it to them to judge of their ſufficiency. For inſtance, if the ſmall pox be mortal in it's own nature, the danger muſt be inherent in the contagion itſelf: now the contagion itſelf is either always the ſame, or is ſuſceptible of a change; if the contagion itſelf can be changed, the natural conſequence muſt be, that the altered contagion affects the animal body in a different manner, and produces other alterations

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in it; but if it cauſe other alterations in our body, then another effect will take place, that is variolous matter will no longer be depoſited by the ſecretory organs, but ſome other; but if another matter be depoſited at the ſurface inſtead of the ſmall pox, all idea of the contagion of the ſmall pox vaniſhes. It is requiſite therefore, that the contagion of the ſmall pox muſt be always the ſame; but it is beyond all diſpute, that the ſame morbid cauſe, when applied to a ſound body under the ſame circumſtances, muſt always produce the ſame effects. If the contagion itſelf of the ſmall pox be thus found to be always the ſame; if it always produce the ſame effects, when adminiſtered under the ſame circumſtances; it follows of courſe, that the diſorder of the ſmall pox, if mortal of itſelf, brings on death, or at leaſt the danger of it, by it's uſual phenomena; becauſe the other ſymptoms are owing not to the ſmall pox itſelf, but either to the epidemic conſtitution united with it, to the previous ill health of the ſubject, or to other accidental cauſes. Now the uſual phenomena of the ſmall pox are undoubtedly by themſelves unattended with danger, provided a proper regimen be employed. But, if the contagion itſelf of the ſmall pox be always the ſame; if it always bring on the ſame diſorder, under the ſame circumſtances; and if it's uſual phenomena be not dangerous; it is evident, that the other ſymptoms, often occaſioning danger and death, are not to be attributed to the ſmall pox itſelf, but to this diſeaſe being joined either with the epidemical conſtitution, or with ſome other morbid ſtate, by ſome contingent circumſtance. Thus the ſum of what I have hitherto proved amounts to this, that the

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ſmall pox, by itſelf, without any complication either with the epidemic conſtitution, with the previous ill health of the patient, or with ſome other contingent cauſe, is never attended with danger.

What is here proved by ſound reaſoning is confirmed by the obſervations of phyſicians, as they all agree, that only general rules can be laid down for curing the malignant ſmall pox, and that various medicines ought to be given, according to the different circumſtances in various caſes, ſo that Dr. Stoll, leaving the ſmall pox to itſelf, has not unfrequently performed the whole cure by purgatives combined with emetics *. It is ſometimes advantageous to employ ſtimulating medicines oppoſite in their nature to the contagion of the ſmall pox; which again ſhows, that the malignity of the diſeaſe ought to be derived not from the contagion itſelf of the ſmall pox, but either from the epidemical conſtitution, or the peculiar condition of the patients. In fine, inoculation itſelf affords an argument, that clears this matter of all doubt: for if the inoculation be performed with matter, taken from patients labouring under a ſevere kind of the ſmall pox, or even from the body of one killed by this diſeaſe, it nevertheleſs, *ceteris paribus*, ſucceeds as well as otherwiſe; and the diſeaſe proves as mild, as when the inoculation is performed with matter taken from the mildeſt ſort of the ſmall pox †: we ought

* *Rat. Med.* part ii, p. 153.

† See, the excellent treatiſe on the ſmall pox, written by Dr. Bicker, *het zevende deel van het Zeeuwſche Geenoodſhap der Weetenſchappen*

ought only to be cautious, that the patient, from whom the matter is taken, does not likewiſe labour under ſome other diſtemper equally contagious, which may be communicated to the inoculated ſubject, as experience has proved. May it not then ſafely be concluded, that the contagion of the ſmall pox does not prove mortal, but from ſome accidental cauſe? This law, as a general rule of nature, holds good even with reſpect to the plague itſelf. It may ſeem paradoxical for me to maintain, that this ſcourge of mankind is not in itſelf mortal; but the following arguments may be adduced in ſupport of my opinion.

1. It proves nothing, that the plague, when epidemic, makes, in general, great ravages; as the ſmall pox, before inoculation was invented, ſwept away almoſt the ſeventh part of mankind, according to the common calculation, and when it firſt enters any country it is not much leſs deſtructive than the plague; for the ſmall pox has raged with ſo great violence in *Siberia*, that whole provinces have been almoſt totally deprived of inhabitants *.

2. The plague, though often joined with a putrid fever, is yet by no means a putrid diſeaſe; as the learned Orræus obſerves, that the carbuncles are free from all ſtink, and putreſcence, and that no

Weetenſchappen, p. 18, who inoculated his own children, and ſeveral others, with variolous matter taken from a dead body, with the utmoſt ſucceſs: and Vogel, l. l. ii Theil, kapitel ii, ſeite 201, where many ſuch inſtances are recorded.

* Samoilowitz *Mémoire ſur l'Inoculation de la Peſte*, p. 14 and 15. *Straſburg*, 1782.

mark of a tendency to putrefaction manifeſts itſelf in this diſorder when ſimple *; yet the plague, in the ſame manner as the ſmall pox and the other *exanthematous* diſorders, does not always appear under the ſame form, but exhibits various ſymptoms, according to the various morbid ſtates with which it is combined.

3. The plague frequently unites itſelf with other acute diſeaſes unſuſpected by the phyſician, from which conjunction it's malignity ought on many occaſions to be derived †.

4. The plague never proves deſtructive to mankind, without ſome previous violent epidemic conſtitution, which ſeems to ſubſide at the arrival of the plague; but the contagion of the plague is then really joined with the previous epidemical conſtitution, hence the plague undergoes various changes, and preſents itſelf under various forms, according to the different previous epidemie. For inſtance, the plague of *London*, which, according to the teſtimony of *Sydenham* ‡ ſucceeded to a violent inflammatory epidemic, repeatedly required bleeding; whereas veneſections, though ſometimes uſeful in the plethoric, were nevertheleſs in general evidently injurious in the plague of *Moſcovy* §, which, according to the account of Dr. de

* L. l. conſect. 1, p. 162.

† Orræus, l. l. *Experientiæ* 12, p. 66.

‡ *Opera omnia*, ſect. ii, cap. ii, p. 104.

§ Orræus, l. l. *experientiæ* 26, p. 124.

Mertens,

Mertens, followed after a putrid, and nervous catarrhal fever *.

5. Many patients in the plague of *Marſeilles* were ſo ſlightly affected, that the eruption of the buboes took place without the leaſt ſymptoms of a fever, and the patients walked about the ſtreets †; which ſhows, that death is not brought on by the peſtilential contagion itſelf, but by the epidemic complicated with it.

6. The change of ſeaſons, and of the ſtate of the atmoſphere, has alſo the greateſt influence on the plague ‡. Dr. Ruſſel obſerves, that the plague is diminiſhed in the winter, increaſes in the ſpring, and is at it's height in the ſummer §. This is more ſtrongly confirmed by the learned Orræus, who ſpeaks in the following terms: "The plague ra-
"vaged principally in the ſpring, and the autumn,
"and was always more violent, if the weather con-
"tinued rainy and warm; on the contrary as ſoon
"as the weather became more dry and ſettled, with
"a north, or north-eaſt wind, even in the middle
"of the ſummer, if it were not entirely extin-
"guiſhed, at leaſt it grew much milder. But the
"winter approaching, the contagion was gradually
"diminiſhed, and at length totally deſtroyed by the
"continually increaſing cold."

* *Obſervat. Med. de Febribus putridis, ac Peſte,* part i.

† Chicoineau *Traité ſur la Peſte,* ſpec. v, p. 41.

‡ Mertens, l. l, part ii, cap. 1, p. 89, and cap. ii, p. 109.

§ Natural Hiſtory of Aleppo.

7. The

7. The plague obſerves the ſame rules in it's courſe as the other exanthematous diſeaſes: for in it's commencement it may be eliminated out of the body by the inſenſible perſpiration; whereas the diſorder having proceeded farther, the ſuppuration of the buboes and the carbuncles, as the only ſalutary criſis, ought to be promoted with the utmoſt care *.

8. When the plague appears only ſporadically, as often happens, it is found, like the ſmall pox, to be much leſs pernicious; as then the contagion may often be vanquiſhed in the beginning of the diſeaſe, and expelled out of the body by gentle diaphoretics †.

9. The plague, when communicated by inoculation, though even the peſtilential fever be epidemic, exhibits much ſlighter ſymptons: hence Dr. Samoilowitz has concluded, and, according to my humble opinion, with the greateſt juſtice, that the plague, like the ſmall pox, may be mitigated by inoculation, if the body be properly prepared before-hand ‡.

10. Dr. Orræus has proved by a great number of obſervations, that the anomalous and moſt violent ſymptoms of the plague, called either malig-

* Orræus, l. 1, *experientiæ* xix, p. 100.

† Orræus, l. 1, *experientiæ* ix, p. 64.

‡ *Mémoire ſur l'Inoculation*, &c., p. 1 to 24: and *Lettre ſur les Expériences des Frictions glaciales pour la Guériſon de la Peſte*, p. 51.

nant

nant or acute, are very often owing to a morbid matter, contained in the primæ viæ *.

11. In fine, I muſt add to all this, that patients labouring under the plague are beſides afflicted with deſpair of the event, and the moſt anxious dread of death, to which the want of help does not a little contribute, they being forſaken by every body as ſoon as the diſeaſe appears: for it will no doubt be evident to every one, who conſiders the great influence the violent paſſions of the mind have even in a mild diſtemper, that theſe have likewiſe a conſiderable ſhare in the fatal effects of the plague.

Therefore, if the plague follow the ſame laws, as the other exanthematous diſorders; if, as well as the others, it be found different, according to the different epidemic that prevails; if it undergo the ſame changes as the others from the ſeaſons; if it ought to be treated with different remedies ſuited to the different morbid cauſes joined with the the plague; if, when only met with ſporadically, it's contagion be much milder, and more eaſy to be removed: if, when communicated by inoculation, it become milder; if, in fine, they who labour under this diſeaſe can often perform their daily occupations; does it not naturally follow, that even the peſtilential contagion, when communicated to a ſound body by inoculation, would produce a diſeaſe by no means dangerous?

Before I proceed to the inquiry into the ſources, from which the fatal events of the exanthematous

* L. 1, *conſect:* xxiv & xxv, p. 215 et ſeq.

diſorders

diſorders are to be derived, I cannot but dwell a little upon the queſtion, whether the plague may be prevented, and what is it's proper treatment, when exiſting: matters, indeed, of the firſt importance to mankind in general, and more eſpecially to the *ottoman empire*, the inhabitants of which are ſo often afflicted with this dreadful complaint. To theſe queſtions I anſwer, that though experience has proved, that the plague cannot be prevented without avoiding all intercourſe with the ſick, and even with the infected air, ſtill, in my humble opinion, if proper regulations be adopted, perſons will not be ſo eaſily infected, and the fatal events of the plague, at leaſt in healthy conſtitutions, may always be prevented. In reality, as it is evident from what has been ſaid, that the plague is a mild diſeaſe of itſelf, and only proves mortal by it's complication with ſome other morbid ſtate, it follows of courſe, that whatever impedes the complication of the plague with other diſorders alſo prevents it's fatal effects: however, as different and even oppoſite diſtempers may be combined with the plague, it is very difficult to lay down a general treatment of the diſeaſe: yet, as it appears evident from the above obſervations, that the complication of the plague with an inflammatory diatheſis is very ſeldom met with; that the diſeaſe moſtly inclines either to a bilious or a putrid complication; that it's malignant ſymptoms are not unfrequently to be aſcribed to the ſordes of the primæ viæ; that in fine, the contagion of the plague, when ſimple, may, in it's commencement, be very often happily diſcharged from the body by diaphoretics; ſound reaſoning, confirmed by a great number of practical obſervations, directs us to proceed

ceed in the following way: let a drachm of camphor be triturated with two drachms of gum arabic; add to theſe an ounce of ſugar, and diſſolve the whole in a pint of vinegar added gradually. Let one ſpoonful of this ſolution be taken thrice a day by every perſon, without which, eſpecially during an epidemic, he muſt never go out in the morning, particularly to viſit the ſick. The attendants of the ſick muſt take a ſpoonful of this mixture every two hours; for by this the vital power of the abſorbent veſſels being properly ſtimulated, the elective power inherent in their orifices becomes vigorous, and thus the contagion is prevented from entering the body; as it is well known, that camphor renders the action of any contagion whatever on the body difficult. Morever, the camphor, by it's ſtimulus, promotes all the functions of the body, eſpecially the perſpiration; and the more, as it's diaphoretic virtue is augmented by the addition of vinegar. As it is evident, that the complications of the plague are to be derived from the impeded functions of ſome organs, and it is alſo proved, that the contagion of the plague itſelf may be expelled in it's commencement by diaphoretics, the utility of the above mixture, both in preventing and curing the plague, needs no farther demonſtration. Beſide this mixture, rhubarb ought from time to time to be employed to keep the firſt paſſages clear. In conjunction with theſe remedies, the drinking of tar-water will be adviſable, as this medicine both purifies the ſyſtem, and deſtroys in a great meaſure the ſuſceptibility of perſons for contagion.

If, either from neglecting the above rules, or from a ſtrong prediſpoſition to the diſtemper, not-

 withſtanding

withſtanding the uſe of the mixture, any perſon ſhould be ſeized with the plague, which, however, I believe will not frequently be the caſe, let him directly have recourſe to a vomit of emetic tartar; for the purpoſe not only of clearing the firſt paſſages, but alſo of propelling the contagion to the ſurface of the body. After that, for ſecurity, a purgative of calomel is to be adminiſtered, to expel by ſtools any ſordes, that may ſtill remain in the bowels. The firſt paſſages being thus cleared, a decoction of the bark, mixed with camphor triturated with alkohol, is directly to be given; by means of which the ſolids are ſufficiently ſtrengthened to counteract the morbid ſtimulus, to expel it from the maſs of humours, and to carry it either to the glands or to the ſurface of the body.

It is obvious, that, when either the patient is very plethoric, or the plague is joined with an inflammatory *diathefis*, the cure muſt differ. In the firſt caſe, a bleeding ſhould precede the other medicines; and in the ſecond, the above medicines muſt be laid aſide, and the plague is to be cured by repeated bleedings and the antiphlogiſtic treatment, which laſt caſe nevertheleſs but ſeldom happens.

Thus there is ſtrong reaſon to believe, that, though the contagion of the plague cannot be prevented, ſtill by employing the above methods, it's contagion may be rendered leſs infectious, and the fatal effects of this dreadful complaint, if not always, at leaſt in moſt caſes, may be prevented. Theſe, however, are by no means the moſt effectual remedies for the checking of this dreadful diſorder; for the moſt powerful

mean

mean of putting a ſtop to the fatal effects of the plague is no doubt it's inoculation; ſince, as I ſhall hereafter prove, it is a general law of nature, that all contagious diſorders become milder when communicated by inoculation. Of this we have a ſtriking inſtance in Dr. Samoilowitz, who, in the plague of Muſcovy, attending a ruſſian military hoſpital, inoculated himſelf. The conſequence was, that the plague came on him, but the ſymptoms of the diſeaſe were much milder, and he got the better of the complaint much more readily than thoſe, who had caught the infection in the natural way. But if the contagion of the plague become milder by inoculation, even when communicated in an hoſpital during the height of the epidemic, and in an unprepared body, it muſt naturally follow, that the plague would prove a mild diſorder, if it's inoculation were performed on a prepared body, and in the beginning of the epidemic.

With regard to the third: As the exanthematous diſeaſes, though not mortal of themſelves, yet often occaſion great ravages, it appears, that there muſt be ſeveral cauſes, by the aſſociation of which the exanthematous diſorders degenerate from their natural mildneſs, and become dangerous and mortal. Theſe cauſes, in my humble opinion, may be reduced to the five following: viz. 1. the epidemical conſtitution: 2. the time of the year: 3. the age, conſtitution, and manner of living of the perſon attacked: 4. the previous ill health of the patient: 5. improper treatment: each of which I ſhall now briefly conſider.

1, The epidemical conſtitution is to be ranked the firſt among the means, by which the exanthemata become mortal. Hence the celebrated Stoll adviſes phyſicians to attend much more to the epidemic conſtitution, than to the *exanthemata* themſelves*; obſerving, that, in a bilious epidemical fever compounded with the ſmall pox, he had employed ſuch medicines as the nature of the epidemic itſelf required, in the ſame manner, as if no ſmall-pox had been complicated with it, with ſuch ſucceſs, that, though he had paid no regard to the ſmall pox, and had adminiſtered, according to the various circumſtances, either emetics or emetic purgatives, nevertheleſs almoſt all the patients were reſtored to health; he farther adds, that he had cured in the ſame way, and with like ſucceſs, meaſles accompanied with a bilious pituitous fever†; whereas the anomalous ſmall pox, and the meaſles which raged in *England*, in the year 1670, and which the immortal Sydenham has deſcribed, were, apparently, of an inflammatory kind, and a ſtrict antiphlogiſtic method of treatment was required in them‡. Other eminent writers obſerve the ſame both of the ſmall pox, and the other exanthemata. Thus, for inſtance, the celebrated Vogel ſtates, that the malignity of the meaſles ought almoſt entirely to be attributed to the epidemical conſtitution§; and, ſpeaking of the other exanthemata, he ſays, that only a few general rules can be laid down with regard to the cure of them, but that both the petechial fever, and other exanthe-

* *Rat. med.* part ii, cap. xii, p. 179.

† L. l. p. 166.

‡ *Opera Omnia*, ſect. iv. cap. v, and vi, p. 187 ad 205.

§ L. l. theil iii, *kapitel* iii, p. 221.

matous

matous diſeaſes ſhould be treated with different medicines, according to the circumſtances, and ſuited to the various epidemics that prevail *. The illuſtrious Burſerius agrees with him, and ſhows by many examples, that no certain laws can be eſtabliſhed for the cure of exanthematous diſeaſes, but that they ſhould be differently treated, according to their various complications †.

2, The time of the year follows next after the epidemical conſtitution; and to this alſo the modification of the ſmall pox ought not unfrequently to be aſcribed; particularly as the epidemic diſeaſe itſelf undergoes various changes from the different ſeaſons, for which reaſon, *ceteris paribus*, the malignant epidemics of the ſmall pox moſtly happen in the ſummer, as they are then often complicated with putrid fever. Haller has recorded an extremely fatal complication of the ſmall pox of this kind, which happened in the ſummer of the year 1735. In this epidemic the pocks were interſperſed with black ſpots; the puſtules, eaſily receding, were flat, pale, and confluent; other ſymptoms, denoting the torpor of the vital powers, were preſent; and the ſtench, both of the breath and the puſtules, was intolerable. It is ſcarcely neceſſary to mention, that this epidemic would not admit of bleeding, and the antiphlogiſtic mode of treatment; whereas, the body being properly purged, camphor, adminiſtered either in an emulſion, or with nitre, was an efficacious ſtimulus, to excite the ſolids to depoſit the virus of the ſmall pox at the ſurface of

* L. 1. cap. vi, p. 282 and 296. † *Inſt. med. pract.* vol. ii.

the body, and to prepare it there; and by these medicines alone Haller performed the cure *. On the contrary, in the winter, when the habit is more disposed to inflammation, to which moreover the contagion of the small pox naturally inclines, the small pox is complicated, for the most part, with a genuine inflammatory diathesis. In this case repeat bleeding, and the rest of the antiphlogistic treatment, ought to be prescribed; which being properly employed, the patients are for the most part restored to health, as the complication of the small pox with a genuine inflammatory state is the least dangerous of all the modifications of this disorder.

3, Attention ought likewise to be paid to the age, constitution, and manner of living of the patient. If, for instance, a young man of a sanguine temperament, and living very high, be seized with the small pox, it often happens, that, though the prevailing epidemic be by no means of an inflammatory diathesis, the antiphlogistic mode of treatment ought to be pursued, on account of the patient's age and constitution; yet the reigning epidemic is always to be kept in view, because, in such cases, it is frequently complicated, in a greater or less degree, with the inflammatory diathesis. Such a case I have experienced in my own person. Four years ago, being attacked with the small pox, sordes of the primæ viæ were complicated with an inflammatory diathesis; nevertheless, a copious bleeding being premised, and the first passages being properly cleansed by an emetic purgative, a mild

* *Opera minora*, t. III, *Opusc. pathol.* obs. t. iv, p. 350.

kind

kind of ſmall pox broke out, and all went on well till the ſuppuration; at the commencement of which there unexpectedly aroſe a ſtrong palpitation of the heart, heavineſs, great anxiety, difficult reſpiration, and a ſtrangury. The medicines preſcribed did not leſſen theſe ſymptoms, and they continued till veneſection was performed, by which all the ſymptoms were completely removed within a few minutes. In ſuch caſes, when the requiſite bleeding is neglected, an apoplexy, or a ſuffocation, occaſioned by an inflammation of the lungs, carries off the patient, of which the following caſe, recorded by Dr. Bonnet, is a very evident inſtance. A german prince, in the flower of youth, of a ſanguine temperament, and addicted to high living, was attacked with the ſmall pox. As the fever was inflammatory, or at leaſt united with an inflammatory diſpoſition, bleeding was performed; after which a great number of ſmall puſtules broke out, and the patient was relieved in every reſpect. But the following day, that is, the fifth day of the diſeaſe, ſymptoms of an internal inflammation appeared; and a ſecond bleeding not being permitted, all the medicines adminiſtered proved ineffectual, the ſymptoms grew worſe and worſe, and at length the prince died on the tenth day of the diſeaſe. On opening the body all the viſcera were found in a healthy ſtate, excepting the lungs alone, which were ſeized, for the greateſt part, with a violent inflammation; nay an impoſthumation had already taken place in the right lobe. Thus it appeared, that the prince was killed, not by the ſmall pox, but by the inflammation of the lungs, ariſing from an inflammatory craſis of the blood; which demonſtrates, that re-

peated bleedings ought to have been employed; a mode of treatment which Bonnet, as appears from the annexed ſcholion, would have purſued, if the cure had been entruſted to him *. This clearly ſhows, what a fatal event the neglect of requiſite bleeding may occaſion.

4, The previous ill health of the patient greatly contributes to render the *exanthemata* malignant and fatal; ſince it is a conſtant obſervation, that infants, in the period of dentition, women with child, or lying in, newly married men, onaniſts, perſons of a bad conſtitution, or already labouring under acute diſeaſes, are more ſeverely affected with the ſmall pox than other perſons. And the reaſon is evident, as the vital principle, already weakened by different cauſes, cannot reſiſt the variolous contagion with ſufficient force, but, being already greatly debilitated, ſinks under it. The ſame is equally true of all the exanthematous diſeaſes, which, in the ſame manner as the ſmall pox, do not unfrequently kill ſuch ſubjects.

5, Finally, improper treatment is to be enumerated among the cauſes, which often render the *exanthemata* malignant and fatal. For if too great an orgaſm of the blood be excited by wine, theriaca, or other calefacient remedies; which not unfrequently happens among the common people: if, on the other hand, the *exanthemata* be prevented from making their appearance on the ſurface by an imprudent and ſudden expoſition to cold air; or, when already appearing, be made to diſappear, and

* *Sepulchretum Anatomicum*, t. iii, lib. iv, ſect. iv, obſ. lx, p. 230.

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the action of the cutaneous veſſels on the contagious matter be impeded, by the application of too great cold, as may eaſily be done, both in the meaſles and the ſcarlet fever, or if the vital powers be too much weakened by the copious evacuation of blood: in a word, in every caſe, in which a regimen, either too ſtimulating or too antiphlogiſtic, has been purſued, the *exanthemata* may be rendered malignant and fatal; ſo that, if nature, either alone or ſuccoured by phyſic, do not repair the errour, life ſoon ceaſes, and the patient dies, not from the malignity of the *exanthematous* diſorder itſelf, but from the uſe of remedies much worſe than the diſeaſe.

From what has been ſaid the following conſequences may be drawn.

1, The reaſon, why the *exanthematous* diſorders, when communicated to a healthy perſon by inoculation, conſtitute a diſeaſe not in the leaſt dangerous, is to be explained only from this, that their contagions are then applied by themſelves to bodies properly prepared, without the leaſt complication either with the reigning epidemic, or with any other morbid ſtimulus. This reaſon, though it in a great meaſure accounts for the benignity of the inoculated contagions, yet ſeems not to be wholly ſufficient to the explanation of the fact. For, when any contagion is communicated to the body by inoculation, it produces firſt a local diſorder, and is not taken up into the ſyſtem till after it has been previouſly animalized as it were; whereas, when a perſon is infected in the general way, the contagion enters the ſyſtem without any aſſimilation taking place: and

my worthy friend, Dr. Woodville is of opinion, that the mildneſs of the diſeaſe is in great meaſure owing to this.

2, No certain practical rules can be laid down in the exanthematous diſeaſes, but different, and even oppoſite medicine ought to be employed to cure them, according to the circumſtances.

3, As ſpecifics do not prevent diſtempers, but only remove the character of a diſeaſe already exiſting; and as, moreover, the *exanthemata* owe their malignity only to accidental cauſes, and are to be treated with very different medicines, according to the different morbid diatheſis with which they are complicated; it follows, that it is impoſſible to diſcover a ſpecific for any *exanthematous* diſeaſe whatever. For who could fancy to himſelf a remedy provided at the ſame time with an antibilious, an antiſeptic, and an antiphlogiſtic virtue? Yet ſuch a ſpecific ought to have all theſe powers; ſince there exiſt many caſes, in which the whole cure of the *exanthemata* is performed by one of them.

4, The vulgar opinion, that bleeding is prejudicial after the eruption of the ſmall pox, is not only unſupported by obſervations of nature, but is often the occaſion of death; whereas it appears, from what I have ſaid above, that bleeding may be performed during the whole courſe of the diſeaſe with ſafety.

5, That no ſtage either of the ſmall pox, or of any other *exanthematous* diſorder, forbids the uſe either of emetics, or emetic-purgatives, when the complication

complication of the diſeaſe requires ſuch remedies; but that emetics, and the reſt of the antibilious treatment ought to be adminiſtered in all the ſtages of the *exanthemata*.

In fine, I muſt farther obſerve, that, though the *exanthemata* do not bring on death of themſelves, or prevent the uſe of medicines proper for the diſeaſe with which they are complicated, yet ſome precautions are always to be obſerved in the cure of them, according to their different nature. They, for inſtance, the meaſles ſhould by no means be expoſed to the cold air in the ſame manner as the ſmall pox; ſince the contagion of the meaſles, leſs fixed than that of the ſmall pox, much more eaſily diſappears from the ſurface of the body, and when repelled not unfrequently produces a mortal tranſlation. Beſides the ſtate of the lungs ought always to be kept in view in this contagion, eſpecially in weak ſubjects, ſince many catarrhal ſymptoms as it were accompany, for the moſt part, the meaſles, and their morbid matter principally inclines to a *metaſtaſis* on the lungs. In the ſcarlet fever, the diaphoretic regimen ought to be continued during a long time; for, though the diſeaſe be vanquiſhed, if the convaleſcent too ſoon neglect the diaphoretic regimen, or imprudently expoſe themſelves to cold air, they fall into the moſt ſerious maladies, by which many of them die. The ſame may be ſaid of all the other *exanthemata*, in which likewiſe various precautions ought to be obſerved. In general, however, to keep the patient on a ſtrict diet, to take care not to expoſe him to ſudden cold, and to keep up a gentle determination to the ſkin by a plentiful uſe of diluents, is all that is required in ſimple exanthematous diſeaſes.

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The manners of dying from the exanthematous diſeaſes are numerous; for, ſince the *exanthemata* are not mortal of themſelves, but only bring on death, on account of another morbid ſtate being united with them, it follows of courſe, that there are as many different manners of dying from the exanthematous diſeaſes, as there exiſt morbid ſtates with which it is poſſible for them to be complicated: therefore, if, for inſtance, the *exanthemata* be united with an inflammatory fever, the patients die either from gangrene; from the ſecretion of coagulative lymph in the vital organs, by which their function is impeded; or from a local inflammation: whereas, if the *exanthemata* be conjoined with a putrid fever, life is extinguiſhed either by the too great violence of the ſtimulus, by a ſpurious inflammation, or by a *metaſtaſis* at the noble parts, in the ſame manner as in a putrid fever; ſo that the manner of dying from the *exanthemata* is different, and to be explained from what has preceded, or from what follows, according to the different diſorder united with them.

APPENDIX.

AS a kind of appendix to the febrile diſeaſes, I ſhall treat here of the rheumatiſm and the gout, becauſe, though they often exiſt without pyrexy, feveriſh motions are frequent attendants of both theſe diſorders; of courſe they ſeem to claim a place among the febrile diſeaſes.

Rheumatiſm.

Rheumatiſm.

RHEUMATISM is a painful ſenſation of the joints and the muſcular parts between them, brought on in conſequence of the application of cold and moiſture. It is ſometimes confined to one part of the body only; though often ſeveral parts are affected at the ſame time. The diſeaſe is diſtinguiſhed into acute and chronic: the former is attended with conſiderable pyrexia and inflammation; the latter with little or none.

The ſymptoms of the acute rheumatiſm are rigor, laſſitude, thirſt, watchfulneſs, acute pains in one or more joints of the body, attended with tumor and redneſs. Though the diſeaſe may attack chiefly one joint, yet in the acute rheumatiſm the pains generally affect ſeveral joints, but uſually ſhifting their place frequently, and having abated in one joint they become more violent in another. The pains are always very much increaſed on putting the affected parts into motion. The tongue is uſually foul, the body coſtive, the pulſe quick, the urine high coloured, and the perſpiration ſuppreſſed. Sometimes, however, there is a tendency to profuſe clammy ſweats, but which never afford the leaſt relief. The chronic rheumatiſm is commonly the ſequel of the acute rheumatiſm, when imperfectly cured either by nature or by art. It has but little of the inflammatory character, and is uſually not attended with pyrexy, ſwelling, or redneſs of the joints; but the diſorder is chiefly marked by irregular and fixed pains in certain joints and muſcular parts, increaſed upon motion, and greatly influenced

enced by the ſtate of the weather. The rheumatic pains always increaſe toward the evening, and when the patient grows warm in bed. The ſeat of theſe pains, and the different ſymptoms with which both diſorders are attended, ſerve to diſtinguiſh them from the venereal diſeaſe; though often in the chronic rheumatiſm the diſtinction is very difficult, and a great deal of ſtreſs is to be laid upon the moral character of the patient.

The occaſional cauſe of the rheumatiſm is cold, eſpecially when attended with moiſture, and applied to the body when either in any way unuſually warm, or with leſs than it's uſual covering. Hence the diſeaſe is very ſeldom obſerved during the heat of the ſummer; and in the winter it is much leſs frequent than during the ſpring and autumn, becauſe the cold is then conſiderable and conſtant; though, as the celebrated Dr. Cullen obſerves, the diſeaſe may occur at any ſeaſon, if viciſſitudes of heat and cold be for the time frequent. The predisposing cauſe of this diſeaſe ſeems to be the natural condition of the human body; for, provided men are not hardened from their childhood ſo as to brave the changes of the weather, and the viciſſitudes of heat and cold, the diſeaſe attacks every age, and perſons of all temperaments, ſuppoſing they are expoſed for a ſufficient length of time to the operation of the exciting cauſes. The proximate cauſe of the rheumatiſm ſeems to conſiſt in an inflammation ariſing in conſequence of the inſenſible perſpiration being ſuppreſſed by the application of cold and moiſture. For the extreme veſſels on the ſurface being conſtricted by the cold applied,

applied, the blood from which the matter generally discharged by the insensible perspiration was about to be secerned, operates with a specific stimulus on the vessels of the joints, the ligaments, and the muscular parts surrounding them: the consequence of which is, that the *vis naturæ medicatrix* attempts to remove the noxious stimulus by the increased action of the affected parts. Hence an inflammatory diathesis and fever arise in the affected joint; and of this increased action the whole system partakes, if several parts be affected at the same time, on account of the general irritation produced by their affection. This inflammation is of a peculiar kind, it does not terminate in suppuration; but it often produces a secretion of a transparent gelatinous fluid, in ligamentous and tendinous parts, which gives rise to stiffness, and sometimes anchylosis of the joints. This secerned fluid is usually reabsorbed, and rarely produces permanent tumours; but in case it should not be taken up into the system, the absorbents are to be roused to action by topical stimuli; for an opening made in them, in order to let out the contained fluid, has produced ulcers difficult to heal; which effect however might perhaps have been prevented, if the openings had been healed up by the first intention, by the use of adhesive plaster.

The rheumatism is a disease which does not prove fatal, except when a translation of the disorder from the external parts to the internal organs takes place; though without this, on account of the violent acute pains with which it is accompanied,

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it may bring on a hectic fever, and thus ultimately deſtroy the patient.

In the acute rheumatiſm the cure ſhould be ſuited to the nature of the fever, which accompanies the diſeaſe. If it be of the inflammatory kind, bleeding, eccoprotics, neutral ſalts, nitre, ſal ammoniac, diluents, and the whole of the antiphlogiſtic treatment is to be purſued. After due evacuations, the adminiſtration of tartar emetic in ſmall doſes, the acetated camphor mixture, and the ſpiritus Mindereri, is to be recommended, in order to keep up a gentle diaphoreſis. But if the fever partake of a bilious nature, bleeding rather hurts the patient, and emetics and eccoprotics are the only remedies to be depended upon. Moſt caſes, however, of the acute rheumatiſm partake of the inflammatory diatheſis, and of courſe require bleeding for their cure; though as the diſeaſe does not depend upon a true inflammatory condition of the ſyſtem, but is the conſequence of the general irritation brought on by the application of cold, the increaſed action is generally not ſo high in the acute rheumatiſm as in the true inflammatory fever, and does not require ſuch a ſtrong antiphlogiſtic treatment. Indeed I am very much diſpoſed to believe, that the reaſon, why the acute rheumatiſm ſo often terminates in the chronic, is frequently owing to the antiphlogiſtic treatment being carried too far. Accordingly, as ſoon as the ſymptoms of general irritation are conſiderably abated, and diſtinct remiſſions appear, though the pain in the affected joints, with redneſs and ſwelling, ſhould ſtill continue, inſtead of perſevering in the antiphlogiſtic plan, the bark ſhould be given with

with freedom, and the ſymptoms of local inflammations ſhould be removed by applying ſome leeches to the parts; for as experience proves, that increaſed action may be produced in ſome part, at the very ſame time when the general ſyſtem is in a debilitated ſtate, the practitioner will often find it very proper, under the exhibition of tonics to ſtrengthen the general habit, to uſe topical evacuations in order to moderate the inflammatory ſymptoms in the affected parts.

If a tranſlation of the rheumatiſm from the external parts to the internal organs ſhould occur; the practitioner ought to attempt to bring the rheumatic matter back again to it's former place, by pediluvia, epiſpaſtics, and bliſters applied to the external parts; and by giving wine, muſk, camphor, guaiacum, ammonia, aſafœtida, valerian, and opiates, internally. The *methodus medendi* in ſuch caſes ſhould however differ according to the different organ, on which the metaſtaſis took place, and the ſymptoms produced by it: for if it bring on an inflammatory affection, the antiphlogiſtic treatment ſhould be purſued.

The chronic rheumatiſm is either met with in perſons of a relaxed habit, or is the conſequence of the atony ſubſequent to the increaſed action of the affected part. It is to be cured by the tonic and ſtimulating plan. A great number of remedies are recorded by different authors for the purpoſe: unluckily, however, no one of them is very certain in it's operation, and no practitioner is always able, *a priori*, to determine what remedy will

effect the cure; because the chronic rheumatism is often found obstinately to resist them all. The remedies which either I have used myself with benefit, or have seen successfully employed by others, are the tartar emetic given in small doses so as to keep up a continual nausea, antimonials, cicuta, Dover's powder, the decoction of the dulcamara, mustard whey, and in cases of debility, the bark, wine, and bitters: but especially, the hydrargyrus muriatus, guaiacum, camphor, and calomel, ammonia, and the flowers of the arnica given in an infusion, with which I have cured cases of chronic rheumatism, obstinate even to the guaiacum and the sublimate. In cases where the body is as it were rendered immoveable by the stiffness and acute pains of the affected parts, I have several times seen a perfect cure performed by two drams of the extract of the blue wolf's-bane, dissolved in two ounces of the vinum antimoniale Huxhami, and given from twenty to eighty drops or more, two or three times a day, either alone or with a decoction of the sarsaparilla.

In cases of paralysis caused by the application of cold and moisture, the tinctura guaiaci ammoniata, mustard-whey, the infusion of the flores arnicæ, in conjunction with the sp. sal. ammon. and the extract of the rhus radicans given from ℈ ii to ʒ ii two or three times a day, in conjunction with blisters, are the most powerful means we possess.

With the use of the internal medicines, the application of topical remedies should be conjoined; as often these are even more efficacious in removing the disorder than the internal ones. The chief of them

them are pediluvia, blisters, rubefacients, stimulating plasters, electricity, dry frictions, the wrapping up of the affected parts in flannel, the vapour-bath, the warm-bath, the oleum petrolei with camphor, camphor and volatile liniments, the soap-liniment, and the balsamum vitæ externum, consisting of soap, oil of turpentine, and salt of tartar, from which, in different cases, I have seen much benefit derived.

In order to guard against the return of the rheumatism, it is useful to strengthen the habit in general, and the affected parts in particular, by sea-bathing, the cold bath, and the use of tonics. The wearing of flannel shirts and worsted stockings is likewise to be recommended.

If the rheumatism should prove fatal, either the violent acute pains occasion a hectic fever, which carries off the patient, or a translation of the disease happens to some internal organ. The way in which this disease brings on death, in the latter case, varies according to the organ affected, and the different degree of reaction of the system. Sometimes the patient dies of phrensy; at other times a mortal apoplectic fit is the consequence of the translation of the disease; not unfrequently suffocation takes place; and now and then an universal spasm puts an end to life.

Gout.

The gout seems to consist in a debility of the body in general, but more especially of the stomach and absorbent system, in consequence of which, the

food taken not being properly digeſted, a peculiar degeneracy of the lymph takes place; which no doubt would injure the health of the patient, were it not, that the morbid fluid thus generated is depoſited by the *vis naturæ medicatrix* on the ſmaller joints; more eſpecially of the feet, where, on account of it's ſpecific ſtimulus, a ſpecific inflammation is produced. This is the deſcription of the regular gout: which is called atonic, when the vital principle has not power enough to convey the morbid matter to the joints. Sometimes, though rarely, nature commits a miſtake, and inſtead of carrying the generated morbid fluid to the joints, it is depoſited on ſome internal part; it is then named the miſplaced gout. If the inflammatory ſtate of the joints ſuddenly and entirely ceaſe, while ſome internal organ becomes affected at the ſame time, it is called the retrocedent gout.

The inflammatory action produced in the affected joints by the morbid ſtimulus is of a peculiar nature. Firſt, it generally attacks only the ſmaller joints, eſpecially thoſe of the feet, and the great toes, and the joints of the fingers; though in the inveterate gout, there is often hardly a joint of the body that is not on one occaſion or other affected, and the diſeaſe paſſes ſucceſſively from one joint to another. This inflammation alſo never terminates in ſuppuration; and it has this peculiarity about it, that, after the diſeaſe has frequently recurred, the inflammatory ſtate of the joints uſually ends in a ſecretion of a peculiar fluid, which is depoſited on the outſide of the joint, and for the moſt part immediately under the ſkin; this fluid ſoon becomes dry and firm, and

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paſſes into concretions of a chalky nature *(phoſphas calcis)* which greatly tend to deſtroy the motion of the joint.

The limits between the gout and rheumatiſm are not exactly defined by authors on the ſubject. Both diſeaſes are deſcribed by the ancients under the general name of arthritis, and even modern authors often confound them. Theſe diſorders, however, may always be diſtinguiſhed from each other, by paying due attention to the following circumſtances.

1, The prediſpoſition to the gout is frequently hereditary, and the diſeaſe is generally brought on without any evident external cauſe; whereas ſuch a prediſpoſition to rheumatiſm does not exiſt, and the latter diſeaſe always originates from the application of cold and moiſture.

2, The rheumatiſm uſually attacks the larger, the gout the ſmaller joints; and though both diſorders greatly contribute to deſtroy the motion of the affected part, yet the rheumatiſm never is productive of chalky concretions, or of a nephritic affection, the uſual attendants of the inveterate gout.

3, Healthy perſons of all ages and temperaments contract the rheumatiſm: the gout on the contrary attacks only a certain ſet of people, either prediſpoſed to it by an hereditary diſpoſition, or weakened by ſome cauſe or other.

The rheumatiſm may often be quickly removed; it frequently attacks but once during life; at leaſt it never returns, without expoſure to the exciting cauſes; the gout, on the other hand, if cured at all, is but very ſlowly remedied; and, having once attacked any perſon, it returns at certain intervals, and often without any evident exciting cauſe.

4, The gout, on making it's firſt appearance, is generally preceded by ſymptoms of indigeſtion; as laſſitude, torpor, dejection of mind, loſs of appetite, nauſea, vomiting, flatulency, acid eructations, pains in the region of the ſtomach, coſtiveneſs, and other diſorders of the *primæ viæ*; all which ſymptoms are not met with in the rheumatiſm, unleſs accidentally.

5, The gout attacks only the joints; whereas the rheumatiſm has it's ſeat alſo in the ligamental and muſcular parts.

6, In the rheumatiſm the fever is uſually the ſequel of the general irritation brought on by the parts affected; on the contrary, in the gout, the feveriſh motions are often very much abated, when the ſymptoms of local inflammation appear in the joints.

7, In the chronic rheumatiſm, the complaint is moſtly confined to one part; in the gout, when inveterate, the diſeaſe paſſes ſucceſſively from one joint to another, and often changes it's ſeat.

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8, The urine and ſtools of gouty patients have a peculiar offenſive ſmell; which alterations, as is well known, are not obſerved in the rheumatiſm.

After the ſymptoms of indigeſtion, and other diſorders of the *primæ viæ*, which uſually indicate the approach of the gout, the paroxyſm begins with an unuſual coldneſs of the feet and legs, a frequent numbneſs alternating with a ſenſe of prickling along the whole of the lower extremities, a turgeſcence of the veins, and an acute pain affecting one foot, moſt commonly on the firſt joint of the great toe, attended with ſome degree of chillineſs and fever.

The pains become gradually more violent, affecting the tarſal and metatarſal bones of the foot, with great reſtleſſneſs of the whole body; towards the morning the parts begin to ſwell and to inflame, the pain and fever conſiderably abate, or entirely ceaſe, a gentle moiſture on the foot comes on, and the patient commonly falls aſleep. The pain and pyrexia return again towards the evening, and the ſymptoms continue with more or leſs violence till morning. The mind is very irritable, the tongue is foul, the body coſtive, and the urine is high coloured, and voided in a ſmall quantity.

After continuing in this manner for ſome days, the diſeaſe goes entirely off, and leaves the patient in very perfect health, enjoying greater vigour and perfection in the functions of body and mind, than he had for a long time before experienced; ſo that

a regular paroxyſm of this diſeaſe often contributes a great deal to the cure of other diſorders, and to the reſtoration of the body to perfect health. But though this is true in the beginning of the diſeaſe, yet in it's inveterate ſtages the ſituation of the patient is a very uncomfortable one; for while in recent caſes the returns of the gout are ſometimes only once in the courſe of ſeveral years, yet, after ſome time, the intervals become gradually ſhorter, the attacks come on annually, or twice a year, and at length they return ſeveral times during the whole courſe of autumn, winter, and ſpring: and as with the frequency of the fits the paroxyſms become alſo longer; in the advanced ſtages of the diſeaſe the patient is ſcarcely ever perfectly free from it, except for ſome weeks in the middle of the ſummer. There is another circumſtance that renders the ſtate of the patient very unpleaſant; which is, that, though after the firſt paroxyſms of the gout the affected joints are perfectly reſtored to their former ſuppleneſs and ſtrength, yet, after a frequent recurrence of the diſeaſe, they never wholly recover their former ſtate, but remain weak and ſtiff; and as theſe effects increaſe on each return of the diſorder, they at length proceed to ſuch a degree as to render the affected joints quite uſeleſs.

The remote cauſes of the gout are either predisponent or exciting. The prediſpoſition to the gout depends upon a peculiar conſtitution of the body, and is often hereditary; though it may be brought on by the occaſional cauſes themſelves.

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The exciting cauſes of the gout all operate by weakening the ſyſtem in general, and the digeſtive powers in particular. The chief are a ſedentary and ſtudious life, the luxuries of the table, intemperance in the uſe of intoxicating liquors, exceſs in venery, exceſſive evacuations, and the omiſſion of accuſtomed labour; all which cauſes, by debilitating the action of the chylopoietic organs, produce indigeſtion.

The proximate cauſe of the gout ſeems to be a debility of the ſyſtem in general, and of the digeſtive organs in particular, by which they are incapable of converting the food taken into proper nouriſhment. The lymph, being ſpecifically altered, ſpecifically operates on the abſorbent ſyſtem; the conſequence of which is, that the lymphatic glands, having undergone a certain alteration, ſecern a peculiar fluid, which, being depoſited on the joints of the extremities by the *vis naturæ medicatrix*, produces the paroxyſm of the gout. It is true, this opinion is not ſupported by diſſections of ſuch bodies, as the gout by itſelf very ſeldom proves mortal; but as it is drawn from the fulleſt attention to the ſymptoms and remote cauſes of the diſeaſe, this theory ſeems at leaſt to be more probable, than that the gout ſhould be an affection of the nervous ſyſtem; an idea originating with the immortal Boerhaave, and ſupported by the great Cullen; for a ſuperficial view of the remote cauſes of the diſeaſe, and the ſymptoms uſually preceding it's attack, are quite ſufficient to prove beyond all doubt, that the digeſtive organs, and not the nervous ſyſtem, are the primary ſeat of the diſeaſe. The more eſpecially as all

all the phenomena obſerved in this diſorder may be eaſily accounted for from this theory. In the atonic gout, the lymphatics, on account of their debility and irregular action, do not carry to the feet the generated morbid matter: hence the pains and cramps generally obſerved under ſuch circumſtances in ſeveral parts of the trunk, and the upper extremities of the body, a dejection of mind, palpitations, and faintings; and as nature always makes an attempt to get the better of the morbid ſtimulus, the atonic gout not unfrequently terminates in the miſplaced gout, the morbid matter being depoſited on ſome internal organ by the irregular motions of the abſorbent veſſels. The phenomena, with which the retrocedent gout is attended, may likewiſe be explained without difficulty from the abſorbents taking up again and conveying into the ſyſtem the morbid fluid depoſited by them on the joints; the conſequence of which muſt be the ſudden ceaſing of the inflammatory ſtate of the joints, and a train of different ſymptoms, varying according to the different internal part, to which the morbid matter is conveyed by the lymphatics. Hence we may alſo comprehend, why the paroxyſm of the gout often ſo much contributes to the reſtoration of the body to perfect health; becauſe by it's attack the chylopoietic organs are freed from the morbid ſtimulus. It is not to be denied, that the paroxyſm does not afford ſo much relief to the patient in the inveterate ſtages of the diſeaſe; but the fact is, on account of the weakened ſtate of the body, the paroxyſm is ſeldom critical, and ſufficient to get completely rid of the morbid ſtimulus: the intention of the *vis naturæ medicatrix* is always the ſame, in all

all ſtages of the diſeaſe, but by the frequently repeated efforts of nature to unload the ſyſtem, the ſtrength is gradually exhauſted, and the *vis vitæ* is not competent to the completion of the work; and this is the reaſon why the ſymptoms of atonic and miſplaced gout ſo often occur in the inveterate ſtages; for the vital principle not having power enough to carry the morbid matter to the ſmaller joints of the extremities, the diſeaſe falls on internal organs, producing vomiting, diarrhœa, apoplexy, and inflammation of the viſcera of the thorax and abdomen, according to the different part on which the morbid fluid is depoſited.

But perhaps it may be objected againſt the opinion, that the gout conſiſts in a debility of the ſyſtem in general, and of the chylopoietic organs in particular, that the diſeaſe generally attacks perſons of a full and plethoric habit; and of courſe a vigorous and plethoric ſtate of the ſyſtem ſeems to be the proximate cauſe of the gout. This objection, however, falls to the ground, on conſidering, that the gout very ſeldom attacks the purely ſanguine or melancholic, but moſt commonly men of a cholerico-ſanguine temperament; that the diſorder does not ſeize perſons, though in the higheſt degree plethoric, unleſs they have been previouſly weakened, in ſome degree, by irregular diet, and an improper manner of living. The ſtrongeſt men are generally found among the poor; but it is well known, that the gout is very rarely met with among them; the ſufferers from this diſeaſe being uſually men in eaſy circumſtances, who are addicted to the luxuries of the table, which bear very hard upon the ſtomach,

and

and impoſe upon the chylopoietic organs with much ſeverer duty, than nature has intended they ſhould perform. There is indeed a plethoric ſtate of the ſyſtem: but it is not the true plethora; it is plethora *ad vires*, or plethora joined with debility; for, on account of their relaxed tone, the veſſels do not duly react on the column of blood, and become over diſtended even by a very ſlight ſuper-abundance of blood, which would by no means bring on ſymptoms of plethora in perſons of a ſtrong robuſt habit; it would of courſe not be a very rational practice, to attempt the cure of this kind of plethora by the lancet; but the ſymptoms of plethora are beſt removed by the uſe of thoſe medicines, which, by ſtrengthening the general habit, reſtore the veſſels to their due tone. In fine, that the plethoric ſtate of the ſyſtem, frequently obſerved in thoſe who labour under the gout, eſpecially in the beginning of the diſeaſe, is not owing to the energy of the *vis vitæ*, but originates from a certain degree of debility, is put beyond all doubt by the pernicious effects, of which the antiphlogiſtic treatment has been productive, when carried into execution by the advocates for it in the cure of the gout.

The prognoſis of the diſeaſe ought to be taken from it's duration, and the age of the patient. If the patient be young, particularly if the diſeaſe have been acquired from a bad diet, and irregular manner of living, in a recent caſe great hopes of a radical cure may be entertained. But in perſons, in whom the gout is hereditary, in people of an advanced age, or in the inveterate gout, the complete removal of the complaint is but ſeldom within the

the power of phyſic, and a palliative treatment is generally all that is to be expected from medicines, aided by a proper regimen.

As to the cure of the diſeaſe, during the paroxyſm of a regular gout, the ſymptoms ſhould be moderated, which is moſt effectually done by avoiding all irritation; by keeping the belly ſoluble; by uſing a ſimple diet, and by producing a gentle determination to the ſkin by ſmall doſes of opiates, Dover's powder, the ſp. Mindereri, and a plentiful doſe of diluents. With regard to external applications, the celebrated Sydenham gave it as his opinion, that the more ſevere and painful the paroxyſm is, the ſhorter is it's duration, and the intermiſſion is the longer. There is no doubt, but this renowned phyſician took his idea from nature; it by no means follows, however, from this obſervation, that, in caſes where the inflammatory ſymptoms run very high, the phyſician ſhould ſtand by as a mere obſerver of nature's operations. On the contrary, ſound reaſoning and experience prove, that the violence of inflammation weakens the tone of the parts, and thereby invites a return of the paroxyſms; and that the application of ſome leeches to the affected part brings on a conſiderable relief of the acute pains, and ſhortens the paroxyſm. In all caſes of the gout, the ſurface of the body, but more eſpecially the extremities, ſhould be properly guarded againſt cold: the affected parts are to be wrapped up in flannel, ſo as to keep up the cuticular diſcharge; warm bathing, and emollient poultices to the feet, may likewiſe be applied with advantage and ſafety: the opinion, that they ſometimes give riſe to a retroceſſion

ceſſion of the gout, ſeems to be owing to mere prejudice; indeed it is difficult to underſtand, how remedies of this kind can poſſibly give riſe to a tranſlation of the diſeaſe to the internal organs. Although during the paroxyſm, in young vigorous habits, the diet ſhould be of the antiphlogiſtic kind; yet in the weak or aged, in whom the conſtitution is much broken down by the diſeaſe, ſuch a treatment would be highly improper, and frequently give riſe to the atonic gout; nature, on account of the weakneſs of the ſyſtem, being incapable of freeing the habit from the morbific matter. In ſuch caſes, of courſe, a generous diet, with a moderate quantity of wine, is to be allowed.

Hitherto we have conſidered the paroxyſm of a regular gout, in which, in reality, little is to be done by medicine; but a more active practice is neceſſary in the irregular gout. In caſes of atonic gout, the ineffectual efforts of nature to get rid of the morbific matter ſhould be ſupported by bliſtering the lower extremities, and by taking opiates, camphor, muſk, ammonia, and wine internally; from which remedies the deſired purpoſe is frequently obtained. In the retrocedent gout, what I have recommended on the head of retroceſſion of rheumatiſm holds likewiſe good with reſpect to this diſeaſe. If a violent diarrhœa occur, the taking plentifully of weak broths, emollient glyſters, and opiates, are the beſt remedies.

In caſes of nauſea and vomiting, recourſe ſhould be had to opiates, with cataplaſms and bliſters at the region of the ſtomach. In the miſplaced gout, when

when the morbific matter falls on ſome internal organ, producing in it inflammation, the treatment proper in an idiopathic inflammation of the ſame parts ſhould be purſued. In perſons liable to irregular gout, iſſues or ſetons in the neck or thigh are of great efficacy, in preventing irregular fits, and expelling from the body the morbific matter. If after the paroxyſm ſome ſwelling and ſtiffneſs ſhould be remaining in the joints, theſe ſymptoms may gradually be gotten the better of by the uſe of ſoap, camphor, and volatile liniment, frequent frictions and moderate exerciſe.

In the intermiſſion, the phyſician ſhould make an attempt to prevent the return of the paroxyſms, or at leaſt to render them leſs frequent and more moderate. Cullen is of opinion, that the gout cannot be cured by medicines, but that labour and abſtinence will abſolutely prevent any returns of it for the remainder of life. Accordingly, he conſiders moderate exerciſe, and the living upon a vegetable or milk diet, as the means beſt calculated to cure the diſeaſe. However great the deference I have for the abilities of this juſtly celebrated phyſician, I cannot avoid entertaining a different opinion, as to the moſt powerful means of preventing and curing the gout. That moderate exerciſe and a ſimple diet are juſtly ranked among the chief antidotes againſt the diſeaſe in queſtion, is proved beyond all doubt; there are inſtances on record of rich men, who had laboured under the gout for ſeveral years, and who, having the misfortune of being brought to indigency, were radically cured of the complaint by their being obliged to have recourſe

recourſe to bodily labour, and to live upon a ſimple diet. As nothing proves more efficacious to ſtrengthen the ſyſtem in general, and the digeſtive powers in particular, than continual exerciſe, a moderate ſimple diet, and a regular manner of living, the happy effects brought about by this change of diet and manner of living are eaſily to be accounted for. But I hope to be excuſed for looking upon a ſimple diet, and a low vegetable one, as two very different things: it is not the uſe of animal food that occaſions the gout; it is the eating and drinking too much: the ſufferers by gout we ſhall find are generally thoſe, who indulge in the luxuries of the table, who continually overload the ſtomach by the taking of a variety of things at once, and uſe much more food than their digeſtive powers are capable of converting into proper nouriſhment; and who, at the ſame time, inſtead of rouſing the digeſtive powers into action by conſtant exerciſe, weaken them by a ſedentary and inactive life. Indeed a proper quantity of animal food, far from producing the gout, is rather an antidote againſt it, when uſed in conjunction with bodily exerciſe. Farmers, who live a great deal upon animal food of the moſt difficult digeſtion, are but rarely ſufferers by the gout. In fine, as all remote cauſes of the diſeaſe operate by weakening the ſyſtem in general, and the digeſtive powers in particular, it may *a priori* be concluded with certainty, both that a vegetable or milk diet is ſo far from being able to counteract the morbid ſtimulus, that ſuch a treatment in general cannot be carried into execution with ſafety to the patient; and that a moderate uſe of animal food, by ſtrengthening the general habit, muſt neceſſarily prove uſeful.

ful. This concluſion is completely confirmed by practical experience; ſince in patients, who have entered upon a vegetable or milk diet only in the decline of life, or whoſe conſtitution was much broken down by the diſeaſe, the ſudden change from a full to a ſpare diet has often brought on an atonic gout, and death itſelf has not unfrequently been the conſequence of ſuch a treatment. In young vigorous perſons, it is true, the purſuing of the plan recommended does not ſo readily throw the ſyſtem into an atonic ſtate; yet it has a tendency to debilitate the conſtitution; the ſtomach, in particular, is frequently ſo much weakened by it, as never afterwards to be capable of bearing any ſolid food; not to mention the diſorders of the primæ viæ often produced by a milk diet; as the ſtomach is uſually weak in thoſe, who labour under the gout; and it is well known, that perſons of weak digeſtive organs are generally incapable of bearing a milk diet for any length of time. It is likewiſe to be obſerved, that a milk diet extremely prediſpoſes the patient to many diſeaſes, on account of it's weakening the general habit; does nothing more than ſuſpend the action of the diſeaſe; and is incapable of bringing about a radical cure: ſince to prevent the attack of the gout, the diet muſt be perſiſted in during life; and, if, after having lived upon milk and vegetables alone for the ſpace of two years, the patient return to his former mode of living, the conſequence is, that the diſeaſe recurs with increaſed violence, and in a more irregular and more dangerous form. As thus a milk and vegetable diet proves only a palliative cure for the gout, and prediſpoſes the patient to many diſeaſes, it may juſtly

be concluded, that the remedy is worſe than the diſeaſe, for the removal of which it is intended.

Having ſaid ſo much on the ſubject, in order to ſhow clearly the inſufficiency of a vegetable or milk diet to remove the gout, and the danger attending it's uſe in reſpect to the conſtitution, I ſhall now enter upon a plan of treatment, which, being founded on accurate obſervation, both of the ſymptoms and the remote cauſes of the diſeaſe, I have ſeen attended with the utmoſt ſucceſs in ſeveral caſes.

As the gout originates from the debility of the ſyſtem at large, and more eſpecially from the weakneſs of the chylopoietic organs, during the intermiſſion the general habit ſhould be ſtrengthened, and the digeſtive powers reſtored to their due tone; by the uſe of bark, the preparations of ſteel, chamomile flowers, gentian, and gum galbanum. During the exhibition of theſe remedies, care ſhould be taken, to keep the body open without much purging, or weakening the primæ viæ, which is moſt effectually done by adding to the above remedies rhubarb or aloes. The uſe of the tonics ſhould bebegun with a ſmall doſe at firſt, and after the ſyſtem becomes accuſtomed to them, they may be gradually increaſed; for, if this caution be neglected, and large doſes given at once, the tonics will operate on the irritable ſtomach of the patient as violent ſtimulants, and, inſtead of ſtrengthening the conſtitution, they will often bring on a freſh fit of the gout. Chalybeate or common water ſhould be the ordinary drink; yet a moderate quantity of porter may be

daily

daily allowed with perfect ſafety, and even with advantage to the patient; but the uſe of wine and ſpirituous liquors ſhould be forbidden, for they generally incite the paroxyſm of the gout, by ſtimulating the ſyſtem too much; except in thoſe caſes, in which the patients have been accuſtomed to the uſe of ſtrong drink for a conſiderable length of time; and eſpecially when they are weak, or in the decline of life, for then it is uſeful, and even neceſſary, to allow daily a moderate quantity of ſherry or madeira wine, in order to prevent the atonic gout by ſupporting the *vis vitæ*. Though a moderate uſe of animal food is quite neceſſary to the radical cure of the gout; yet the diet of the patient ought to be a ſimple one; he ſhould not take a variety of things at once, and muſt be careful not to overload his ſtomach. His manner of living ought to be regular: he ſhould go to bed early, and riſe ſoon in the morning; frequent exerciſe on horſeback, and moderate walking, prove powerful tonics for the digeſtive organs, and of courſe ſhould be daily practiſed.

But though a due attention to the remedies recommended will no doubt render the paroxyſms leſs frequent, and more moderate, yet it is to be acknowledged, that they are but ſeldom ſufficient to prevent entirely the return of the gout during the reſt of life: for, as they do not remove the predispoſition to the diſeaſe, the gout makes it's appearance again, as ſoon as any of the exciting cauſes are applied to the body. In conjunction with them, therefore, ſuch remedies are to be exhibited, as more particularly operate on the lymphatic ſyſtem,

and ſeem by a ſpecific power to deſtroy the gouty diatheſis of the body. Indeed, though phyſic is incapable of curing the gout, except a proper dietetic regimen be employed at the ſame time, yet regimen will often be found to fail in removing the complaint, without the aſſiſtance of medicine.

The remedies, by which ſuch ſalutary effects are brought about, are gentian, the flores ſulphuris, rob ſambuci, crude antimony, guaiacum, and the hydrargyrus muriatus eſpecially joined with bark and opium. Their uſe, however, ought to be ſuited to the conſtitution and age of the patient: for as theſe medicines differ very much as to their ſtimulating power, it is evident, that an indiſcriminate uſe of them may do a great deal of harm. If the patient be young, vigorous, and of an irritable diſpoſition, the beſt medicine I am acquainted with to cure the gout is the flores ſulphuris from ℈i to ℈ii a day, made up in the form of an electuary by the addition of one or two ounces of the rob ſambuci. The celebrated archiater of the emperor of Germany, Dr. Quarin *, as far as I know, was the firſt, who recommended the flores ſulphuris combined with the rob ſambuci, in this diſeaſe; and I have ſeen them ſeveral times uſed with the utmoſt benefit to the patient. The rob ſambuci ſeems ſomewhat to contribute to the ſucceſs of the medicine; for when ſulphur alone has been given, the efficacy of the remedy ſeems to be weakened; the uſe of theſe remedies ought, however, to be continued for ſeveral months, in order to anſwer the deſired purpoſe. If

* *Animad. Pract. in diverſ. Morb.* cap. xv.

the

the patient be of a leſs delicate fibre, or rather more advanced in life, the crude antimony is to be recommended. From this I have experienced twice conſiderable benefit. Dr. Quarin has generally combined it with the ſulphur in theſe caſes. The efficacy of this medicine is likewiſe teſtified by the archiater of the king of Denmark, the renowned Dr. Guldbrand, who uſually gives it in conjunction with an infuſion of the flores ſambuci, or joined with aſafœtida in the form of pills *. In caſes where the patient labours under an acidity of the primæ viæ, magneſia, or ſome other abſorbent, ſhould be given along with the antimony. If the patient be of a flaccid relaxed habit, or liable to the atonic gout, recourſe ſhould be had to the guaiacum, either diſſolved in ſpirit of wine, or given in form of pills in conjunction with flowers of ſulphur and antimony. Recent caſes of the gout I have ſeen cured by gentian and gum galbanum, given in the form of pills. In caſes where the patients are not very irritable, and do not labour under any morbid affection of the breaſt, the hydrargyrus muriatus, combined with bark and opium, is to be recommended. The doſe is from a quarter of a grain, to half, and, in a few caſes, to three quarters, or even a whole grain in a day. I have ſeen this remedy exhibited in inveterate gout, where the guaiacum has failed, with the utmoſt benefit: the patients experienced but very ſlight returns of the gout; even the chalky concretions of the joints ſeemed to be gradually abſorbed, and the joints became in a great meaſure reſtored to their former ſuppleneſs

* *Act. Hafnienſ.* vol. 3, p. 320, & ſeq.

and ſtrength. Beſide theſe remedies, ſoap, abſorbent earths, and lime-water, have been recommended: but though I do not queſtion the veracity of thoſe gentlemen, who have attempted to eſtabliſh their credit, yet I cannot help obſerving, that in all caſes, where I have ſeen theſe medicines tried, they have invariably proved unſucceſsful. The aqua mephitica alkalina, we are told, has lately proved efficacious in preventing the returns of the paroxyſms of the gout. The doſe is half a pint twice or three times a day. Of this, however, as I have had no experience of it's effects, I can ſpeak neither in favour nor diſpraiſe. The leſs as it requires to be taken for a great length of time, to obtain the deſired purpoſe; and a long continuance of this remedy does not ſeem to be perfectly ſafe, at leaſt for all conſtitutions, while we have at hand different medicines to cure the gout, which at the ſame time may be given with perfect ſafety to the patient.

By uſing the medicines I have attempted to recommend, in conjunction with tonics, moderate exerciſe, a ſimple diet, and regular manner of living, the gout, when not very inveterate, will generally admit of a radical cure in young perſons, and the patients will remain free from the diſeaſe during the remainder of life; unleſs they again acquire a gouty diſpoſition, by uſing an irregular diet and manner of living. And though theſe remedies, in old people, or in caſes of very inveterate gout, will frequently fail in performing a radical cure; yet they will generally render the paroxyſms leſs frequent, and moderate their violence ſo much, that the conſtitution will not be injured by them, and the patient

tient may enjoy a pretty healthy ſtate for ſeveral years.

If the gout prove mortal; it kills either by dropſy, produced by the weakneſs of the ſyſtem, a natural conſequence of the frequently repeated paroxyſms; or the patients are deſtroyed by an atonic or miſplaced gout: in the latter caſe they are uſually carried off either by an apoplexy, or by an inflammation of the lungs; though ſometimes they die under the efforts of nature to bring the morbific matter back again to the joints, that is, amid convulſions.

PART III.

Of Death

Ensuing when the Action of any vital Organ is suppressed; or of the Death, which follows the disordering the Chain of the vital Powers from the Action of one or two Links in the Middle being destroyed.

AS the life of the whole body is, ſtrictly ſpeaking, produced from the concordant vital actions of all the parts of the body, I have obſerved above, that life may be aptly figured by a chain conſtructed of many links ſuſtaining one another, in which the chain reſembles the vital principle, and the links expreſs the vita propria of each organ.

If it be now aſked, in how many different ways the chain may be broken, that is, in how many ways man can die; I anſwer, that either the whole chain may be equally deſtroyed, or ſome link may be ſtruck out from the middle of the chain, by which the deſtruction of the whole chain will be no leſs certainly accompliſhed.

In the preceding part I treated of the diſeaſes operating in the firſt way: I ſhall here take notice of the diſeaſes acting in the ſecond manner. To theſe belong all the local diſeaſes, which, though numerous, and very different from each other, may nevertheleſs, with regard to their manner of killing, be reduced to the five following claſſes: viz.

Claſs

Claſs viii. Death from Inflammations.

ix. ——— Fluxes.

x. ——— Cachexies.

xi. ——— Diſeaſes of the Nervous Syſtem.

xii. ——— Diſeaſes of the ſecretory Organs.

Although theſe diſeaſes moſtly put an end to life in the above way, it is not to be denied, but that they ſometimes occaſion death by the deſtruction of the vital principle; for when either the afflicted organ is provided with a great number of nerves, or the patient is very irritable, the moſt violent efforts of the vital powers often ariſe, and the patients not unfrequently expire under dreadful convulſions; nay, tetanus, which for the ſake of order I am obliged to rank among the diſeaſes occaſioning death from the vitiated function of the nervous ſyſtem, when fatal, almoſt always operates by deſtroying the vital principle: ſuch caſes, however, which happen but ſeldom, are to be conſidered as exceptions to the general rule. In fine, when I aſſert, that the local diſeaſes take away life by the deſtruction of one or two organs, I do not maintain, that the other organs are not affected by the morbid ſtimulus; but I mean only, that the other organs ſuffer merely by ſympathy, or that, at the utmoſt, the noxious power is ſometimes ſecondarily communicated to ſome of them.

CLASS VIII.

Death from Inflammations.

When by any cauſe the *vis vitæ* of the ſanguiferous ſyſtem is incited to ſuch a degree, that tumour, redneſs, heat, and pain, are produced, whether this incitement of the ſanguiferous ſyſtem be real or ſpurious, the morbid condition is named an inflammation: if the whole of the ſanguiferous ſyſtem be incited in this determined way, an univerſal inflammation, or an inflammatory fever enſues; whereas, if the action of the ſanguiferous ſyſtem be incited only in ſome particular part, a local inflammation is produced: the former, however, is moſtly attended with the latter; as the latter, alſo, not unfrequently changes into the former. This definition of an inflammation ſeems to me to agree better with the phenomena of nature, than that of the illuſtrious Hufeland, according to which the incitement of the vita propria of the blood is alſo requiſite to it, ſo that a buffy coat *(cruſta phlogiſtica)* muſt always be generated on it *: for if ſuch a condition of the blood were a characteriſtic mark of inflammation, no inflammation could ever happen without it, and, *vice verſa*, this condition would alſo never be obſerved without an inflammation. Now the contrary is aſſerted by the moſt eminent practitioners. Van Swieten relates, " that he has

* Hufeland. l. l, ſect. 3, kapitel v, p. 303.

" obſerved

" obſerved ſuch a buffy coat in the ſoundeſt men, " who are accuſtomed to get themſelves bled every " year in the ſpring:" and he obſerves, that " it " was always found in a weak man, who was bled " every three months to prevent an hemoptoe, " under which he had before laboured: thus ſuch a " ſtate of the blood may exiſt, though there be not " the leaſt inflammation; and, on the contrary, no " buffy coat can ſometimes be found even in the " moſt violent inflammatory diſeaſes *." The immortal Sydenham remarks, that the exiſtence or non-exiſtence of ſuch a buffy coat depends in a great meaſure upon the manner in which the blood iſſues from the vein: " thus, if the blood do not " ſpout out from the vein in a horizontal direction, " but trickle down the ſkin perpendicularly, even " though it may flow pretty quickly, it frequently " will not exhibit the buffy coat †." Laſtly, the illuſtrious Selle ſpeaks thus on the ſubject: " As " the inflammatory condition of the blood (at leaſt " that, which evidently appears) is rather to be " conſidered as an effect of the fever, ſo perhaps " there is ſomething elſe requiſite to the exiſtence " of an inflammation, that is not in the buffy coat: " for often, either no inflammatory ſtate of the " blood is found; or it ſometimes appears only, " when the inflammation has already exiſted ſome " time; and in fine, it not unfrequently happens, " that the blood, though before inflammatory, now " appears diſſolved, without the leaſt diminution of " the inflammation ‡." In the ſpurious inflam-

* L. 1, t. i, *Aphoris.* 384, 652. † L. 1, ſect. 3, cap. vi, p. 264.

‡ L. 1, p. 114.

mations,

mations, called, though inaccurately, *erysipelatous* by some moderns, the buffy coat is for the most part not to be observed; yet it would be absurd to exclude these from the class of inflammations; for internal inflammations are often of this kind; and there are even viscera, which scarcely ever labour under a true phlegmonic inflammation. I shall not observe in addition to this, that such a state of the blood is only the effect of a peculiar manner of acting of the vessels on the blood, as what has been said already proves beyond all doubt, that the opinion of Hufeland is contrary to actual observations of nature.

Let it not be argued, that in this way inflammation is confounded with fever: for, though I readily agree, that the incitement of the *vis vitæ* of the sanguiferous system is also requisite to a fever, nevertheless the one differs from the other in it's degree, as, *ceteris paribus*, a greater incitement of the *vis vitæ* of the sanguiferous system is requisite to an inflammation, than to a fever: *ceteris paribus*, I say, since a slight inflammation is often found without any remarkable fever. The degree of incitement necessary to an inflammation cannot well be determined, as it must greatly differ in different subjects, and even in the same person, according to various circumstances, because the stimuli are only relative with regard to the subject, on which they operate, and of course the same degree of incitement will produce in one subject a fever, in another an inflammation, and in a third person both. It is however by no means requisite to an inflammation, that the above symptoms be always observed, as in the inflammations

flammations of the viſcera, eſpecially when ariſing in ſubjects of a bad conſtitution, they are often either partly or wholly wanting.

The cauſes of inflammation may be reduced to two principal ones *, viz. " An inflammation ariſes " either from the weakneſs of the capillary veſſels, " which renders them unable to reſiſt the uſual " impulſe of the blood; or from a violent impulſe, " when the uſual reſiſtance of the capillary arteries " is incapable of ſuſtaining the force with which " the blood is propelled by the heart, and the prin- " cipal blood-veſſels." To the former belong the inflammations, which ariſe in putrid, and in other malignant fevers; thoſe, that owe their origin to cold, contuſions, fractures, or herniæ; in a word, all thoſe which are commonly called paſſive or ſpurious: as on the contrary, all the acute, real, or active inflammations, ariſe from the latter. The inflammation is ſometimes produced from both theſe cauſes together: for inſtance, a ſevere contuſion will occaſion a ſpurious inflammation; but in a vigorous man, ſuch a contuſion ſoon brings on a fever, the whole ſanguiferous ſyſtem partaking of the ſhock, and the blood is impelled with the utmoſt velocity through the body; thus both the cauſes of inflammation concur together, and the inflammation is, in ſuch a caſe, as it were, compounded of a real inflammation, and a ſpurious one. Inflammation terminates in ſeven different ways: viz. *reſolution, ſuppuration, gangrene, induration, ſecretion of coagulable lymph, tranſudation through the inflamed*

* Dr. De Leon *Inflammatione*, p. 16.

veſſels,

veſſels, and a rupture of them. I ſhall not ſpeak of the firſt three, which are admitted by every one: when I come to treat of the event of internal inflammations, I ſhall mention the laſt three, which are often fatal: and in the mean time, I ſhall ſay a few words on induration. Some moderns have denied this termination of inflammation *; but when I conſider, that an induration frequently remains after a boil not having properly ſuppurated †; that the ſame often takes place in the inflammation of the lungs, and that even the origin of a conſumption ought ſometimes to be aſcribed to this ſource, namely, to the indurated veſſels becoming ſucceſſively inflamed ‡; I cannot but rank induration among the modes in which inflammation terminates: for, why ſhould it be denied but that, what is frequently obſerved on the external parts, and what ſometimes happens in the lungs, may alſo ſometimes take place in the other viſcera, ſtill more expoſed to chronical inflammations? therefore induration ought not only to be enumerated among the events of inflammation; but it is one of the moſt frequent, eſpecially in the venous inflammation of the liver. Now whether ſuch indurations may be called *ſcirrhous* ſeems to be a different queſtion, but of this, being entirely foreign to my deſign, I can take no notice.

Having thus premiſed a general view of inflammations, I ſhall proceed to treat of ſuch as are ſeated

* Cullen, l. 1, vol. i, book iv, p. 238.

† Richter *Anfangsgrunde der Wundarzneykunſt*, i *band, kapitel* vii, § 237 and 241.

‡ Stoll, *Rat. Med.* part i, p. 73, and the following.

internally. I have changed the indeterminate and vague appellations of phrenitis and paraphrenitis, for thoſe of encephalitis and diaphragmatitis; for a conſtant delirium frequently occurs in continual fevers, without any inflammation of the brain, from a morbid matter adhering either at the orifice of the ſtomach, or in the abdominal viſcera *; whereas many inſtances of inflammations of the brain without the above ſymptoms are on record †. The ſame may be ſaid of the inflammation of the diaphragm, which is often obſerved without the ſpaſmus cynicus and delirium ‡; as, on the contrary, the illuſtrious Quarin has proved by a great number of inſtances, that theſe ſymptoms alſo very often occur without the leaſt inflammation of the diaphragm §.

In fine, I do not particularly take notice of the iliac paſſion; ſince, though it moſtly terminates fatally, it nevertheleſs always produces an inflammation of the inteſtines, and kills in this way alone: accordingly, Dr. Simſon, who had an opportunity of diſſecting many ſubjects carried off by the iliac paſſion, always found in them the inteſtines very much inflamed ‖; and Dr. Quarin has invariably obſerved the ſame phenomena in a great number of perſons deſtroyed

* Stoll, *Rat. Medend.* part 3, ſect. 3, de *Cauſa* et *Sede Phrenitidis*, p. 100.

† Quarin, l. l. cap. xiv, p. 210.

‡ Morgagni de Sedibus et Cauſis Morborum, cum Prefatione Tiſſoti, t. iii, lib. iv, epiſt. 53, art. 3, 5, et 41.

§ L. l. cap. 18, p. 338.

‖ *Medical Eſſays and Obſervat.* vol. v, part ii, art. 57, p. 154.

by

by this diſeaſe *. I ſhall not ſeparately treat of all the internal inflammations, becauſe the great analogy they bear to each other renders a general account of them quite ſufficient; and in this I ſhall proceed after the following manner: Firſt I ſhall inquire, what ſymptoms always attend the phlegmonic internal inflammations: ſecondly, how far the erythematic agree with the phlegmonic, and how far they differ from them. Theſe queſtions being reſolved, I ſhall examine, in the third place, by what cauſes death is produced in the inflammations of the viſcera: and in the fourth place I ſhall add, in how many ways they may deſtroy life.

As to the firſt: It is very difficult to aſſign certain characters to the phlegmonic internal inflammations, ſince there are ſcarcely any ſymptoms, which may not be wanting. The following alone, therefore, can be conſidered as eſſential characters of the phlegmonic inflammation, in whatever *viſcus* it may appear: fever; local pain or anxiety; increaſed heat; a hard contracted pulſe, except in the peripneumony, in which diſorder a ſoft pulſe often occurs; difficult reſpiration in the inflammations of the thoracic viſcera; in thoſe of the abdomen, often a vomiting; the diſorder proceeds quickly, and it's change into gangrene is but a rare occurrence; theſe alone are the ſymptoms, which almoſt always accompany a genuine phlegmonic inflammation of any internal part, and which, therefore, ought to be attended to as eſſential characters of the diſeaſe. It is true, that Haller †, de Haen ‡, Morgagni §, and

* L. 1, cap. xxiii, p. 184. † *Opuſc. Pathol.* obſ. 14, hiſtor. 3.

‡ *Rat. Med.* vol. ii, pt. ii, p. 11.

§ L. 1, t. iii, lib. iv, epiſt. 49. art. 14.

Stoll,

Stoll*, mention cases of inflammations of the stomach without the least pain or vomiting; and that the last also relates a case of enteritis, attended with scarcely any fever, and a very slight pain†; but upon an accurate inquiry into these cases it will evidently appear, that they belonged to the erythematic inflammations, and thus can by no means be taken into account here, where I speak only of the phlegmonic inflammations. Though these observations are of weight with respect to the erythematic inflammations; and are confirmed by Cullen, who relates, that he had often found the abovementioned parts greatly inflamed in the bodies of patients who died of a putrid fever, though no marks of inflammation had appeared during life‡. The reason why the phlegmonic inflammations do not so often terminate in gangrene as the erythematic ones, seems partly to be owing to this, that a severe phlegmonic inflammation not unfrequently kills the patient before a gangrene can take place, but especially from a greater tendency to mortification with which the erythematic inflammations are attended.

With regard to *the second:* As often as a local excitement of the *vis vitæ* in any part of the sanguiferous system is produced, by any stimulus, either in a subject of a bad constitution, or in one already enfeebled by previous disease, an erythematic inflammation is generated.

* *Rat. Med.* pt. i, sect. viii, p. 125 & 126.

† L. 1. sect. ix, p. 166 & 167.

‡ L. 1. vol. i, book iv, chap. viii, p. 360.

Although thus the torpor of the *vis vitæ* in the capillary veſſels is the remote cauſe of the erythematic inflammation; and for this reaſon it often ſoon terminates in mortification, becauſe the previouſly weakened *vis vitæ* of the veſſels is farther debilitated even by this excitement; nevertheleſs, a real excitement in the inflamed part always takes place in ſuch caſes. This is proved, not only by the eryſipelas; a ſpecies of erythematic inflammation, in which, though in a different manner from the phlegmonic, the general effects of inflammation, that is, heat, redneſs, pain, and tumour, are obſerved; but, beſides, by the nature of inflammation itſelf, which, from whatever cauſe it may ariſe, always requires a certain, and determined excitement of the *vis vitæ*. Therefore, though the erythematic inflammations often run into gangrene ſo quickly, that not the leaſt marks of excitement in the inflamed part can be obſerved, it may notwithſtanding be concluded, that an excitement has really exiſted; but, as the degree of excitement neceſſary to produce an inflammation is not to be determined, and greatly differs even in the ſame ſubject, according to the difference of circumſtances, this excitement may ſometimes exiſt in ſuch a ſlight degree, and ſo quickly paſs over, as not to be obſervable. Thus oftentimes none of the above phenomena can be obſerved in the erythematic inflammations of the viſcera; for the morbid matter is often ſo pernicious, that the *vita propria* of the inflamed organ is either, as it were, deſtroyed by a ſingle ſhock, or ſo enfeebled, that it's reaction does not ſenſibly appear: whereas, if the noxious ſtimulus be leſs malignant, it does not operate violently, but ſecretly,

cretly, and thus brings on death by degrees. Hence erythematic inflammations of the viſcera are often not diſcovered till after death.

From this ſource may alſo be explained the reaſon, why ichor is always ſecerned inſtead of a mild purulent matter in this kind of inflammations, when terminating in a ſuppuration; becauſe the degree of energy requiſite to a good ſuppuration is always wanting in theſe caſes. But it is to be regretted, that ſuch inflammations, though difficult to be diſcovered, nevertheleſs much more frequently occur, than the phlegmonic ones: as Cullen juſtly remarks, that the inflammation of the ſtomach is almoſt always an erythematic one*; Stoll aſſerts the ſame of the inflammation of the inteſtines†; and Vogel not only agrees with them, but beſides obſerves, that the inflammations of the bladder and the womb, and alſo, in temperate climates, thoſe of the liver and of the ſpleen, are ſeldom truly phlegmonous‡.

With reſpect to the cure. In the phlegmonous inflammations bleeding and the ſtrict antiphlogiſtic treatment are to be purſued; and it ought to be obſerved, that, in theſe caſes, to draw blood from fourteen to twenty-four ounces at once, and from a large orifice, anſwers the purpoſe much better than the loſs of the ſame, and even of a much greater

* L. l. vol. i, book ii, chap. viii, p. 366.

† Cf. *Aphoris de cogn.* et *curand. Febr.*

‡ L. l. t. iv, kapitel, p. 282, kapitel xiii, p. 300, kap. xix, p. 354, kap. xx, p. 384, kap. xxii, p. 409 & xxiii, p. 422.

quantity of blood, at ſeveral intervals. Bliſters are likewiſe very uſeful, eſpecially when applied to the affected part, in order to remove local pain and congeſtion.

But for the cure of the erythematic inflammations, which may ariſe from quite different morbid ſtimuli, no certain rules can be laid down. The reſolution of ſuch inflammations ought, by no means, always to be attempted by the antiphlogiſtic plan; but the mode of treatment ſhould differ in them according to the morbid cauſe, the difference of the ſubject, and the various circumſtances that accompany them. Indeed they are ſo far from always requiring an antiphlogiſtic mode of treatment, that, on the contrary, tonics not unfrequently perform the whole cure, ſo that nothing certain can be determined with regard to them, but different remedies ought to be employed according to circumſtances.

From what has been ſaid it is eaſy to be underſtood, in how far the erythematic inflammations agree with the phlegmonous, and in how they differ from them: for they agree thus far, that a local excitement of the active life of the veſſels takes place in both: they differ in as much as the excitement of the *vis vitæ* of the veſſels in the erythematic is by no means the effect of their increaſed energy, but only of ſome morbid ſtimulus; and that the torpor of the vital principle not unfrequently accompanies this particular excitement.

As

As to the third: The cauſes, from which the danger of an inflammation, whether phlegmonous, or erythematic, ariſes, may be reduced to the ſix following: 1, the reigning epidemic: 2, the cauſe of the inflammation: 3, it's degree: 4, the importance and ſtructure of the organs inflamed: 5, the age, ſex, and conſtitution of the patient: 6, the previous ſtate of the patient's health: which I ſhall here ſeverally inveſtigate.

1, The firſt among the cauſes, which render inflammation fatal, is the reigning epidemic; as the nature, cure, and danger, of the inflammation, often depend upon this alone. Thus Sydenham relates, that the pleuriſy, and peripneumony, which were epidemic at London in the year 1675, were of ſuch a mild nature, that all the ſymptoms gradually diſappeared on proper treatment*: whereas Burſerius mentions a very fatal epidemic ſore-throat, called gangrenous, on account of it's propenſity to mortification†. Though in a phlegmonous pleuriſy blood muſt be copiouſly drawn, nevertheleſs in general the flux of blood is to be ſtopped at the firſt appearance of fainting, that a mortal peripneumony may not ſucceed to the pleuriſy: yet the learned Dr. Cleghorn obſerved an epidemic pleuriſy, in which he had recourſe with the utmoſt ſucceſs to ſuch a bleeding, as ſcarcely any one could undergo without fainting; for this phyſician drew about four pounds of blood within the ſpace of twenty-four hours, and, the ſymptoms

* L. 1. ſect. v, p. 245.

† L. 1. t. iii, cap. xvii, p. 368.

not being diminiſhed before the fourth day of the diſeaſe, he again extracted the ſame quantity in the ſame ſpace of time*. The chev. Brambilla deſcribed an epidemic inflammation of the lungs, which ſeldom attacked perſons either of a weak conſtitution, or of an advanced age, and when it did was of a mild kind; whereas it almoſt always proved fatal to young men, though repeated bleeding, and the reſt of the antiphlogiſtic treatment was preſcribed, till at length recourſe was had to a copious bleeding by way of preventive, in conſequence of which moſt of them remained free from the diſorder†. Fothergill, on the contrary, has obſerved the worſt effects from phlebotomy in an epidemic ſore-throat‡. Theſe inſtances prove how much the reigning epidemic is to be regarded both in the prognoſis and cure of inflammation.

2. The cauſes of inflammation are juſtly enumerated among the principal ſources, from which it's prognoſis and treatment are to be derived; as the event of an inflammation frequently depends upon the greater or leſs importance of it's cauſe, and the facility, or difficulty, with which this can be removed. The immortal Boerhaave, ſpeaking of the prognoſis of encephalitis, declares it to be mortal, when brought on by a peripneumony, or by the iliac paſſion, and very dangerous when produced by the ſmall pox§. Quarin remarks, that a

* L. 1. chap. vi, p. 267.

† L. 1. t. i, p. 409.

‡ *Account of a putrid Sore-throat*, p. 41.

§ *Aphoriſm de cogn. et curand. Morb.* p. 174.

violent

violent pleuriſy, or a peripneumony, happening after a ſore-throat, is ſcarcely curable*. Van Swieten aſſerts the ſame of an inflammation of the liver ariſing from a ſore-throat†. In fine, the learned Dr. Eller obſerves, that, *vice verſa*, a ſore-throat is dangerous when occaſioned either by a previous epidemic dyſentery, or by the confluent ſmall pox; and fatal, if produced either by an inflammation of the lungs, or by a malignant catarrhal fever‡. The famous phyſician de la Mettrie fatally experienced, how much attention ought to be paid to the cauſe of the inflammation of any *viſcus*. He contracted an inflammation of the ſtomach by eating a very large quantity of veniſon, that was but ſlightly dreſſed. Neglecting the cauſe of his diſeaſe, he attempted to vanquiſh it by repeated and copious bleedings alone, but with ſuch ill ſucceſs, that, the vital principle being extremely weakened, by the repeated bleedings, at length a gangrene ſucceeded to the inflammation, by which he was carried off on the fourteenth day of the diſeaſe §.

3, The degree of the inflammation is by no means to be omitted among the cauſes, which ſometimes render it fatal; for it may be ſo violent, as to bid defiance to all medicine. Thus, for inſtance, ac-

* L. 1. cap. xvii, p. 296.

† L. 1. t. ii. § 809, p. 679.

‡ *Obſerv. de cogn. et curand. Morb. præſert. acutis.* ſect. vii, p. 175.

§ Eller l. l. ſect. xi, p. 251.

cording to the obſervations of Sydenham, the inflammation of the windpipe ſometimes kills within a few hours *. Stoll mentions a caſe of a taylor, whoſe lungs were ſo violently inflamed, that, notwithſtanding copious and repeated bleedings, he was deſtroyed by a ſuffocation on the ſeventeenth day of the diſtemper †. A phlegmonous inflammation of the brain, on account of it's violence, ſeldom laſts beyond the ſeventh day, but generally ends in death on the third, or fifth ‡; and Proſper Alpinus relates, that it has proved mortal in three or four hours §.

4, The parts inflamed are alſo to be conſidered in the prognoſis of an inflammation; becauſe it is more or leſs dangerous, according to the various ſtructure of the inflamed organ; to it's different ſituation, both in reſpect to the other parts, and to the more eaſy or difficult application of remedies; and finally, to the different function to which the injured organ is deſtined. Hence the inflammation of the heart is uſually mortal: and the cure of a peripneumony is difficult, as well on account of the perpetual motion of the lungs, and the very tender ſtructure of the veſſels, which are eaſily deſtroyed, as becauſe topical remedies cannot ſo effectually operate on it ‖. Boerhaave remarks, that an inflammation of the ſtomach ſoon proves fatal, on account of the vitiation of a neceſſary function, and it's ſym-

* L. 1. ſect. 6, p. 282.

† L. 1. pt. i, ſect. 14, p. 150.

‡ Quarin. l. 1. cap. 14, p. 214.

§ *De Medicina Ægyptiorum*, p. 50.

‖ Quarin, l. 1. cap. 17, p. 294.

pathy

pathy with the reſt of the body *; to which cauſes may farther be added, that the requiſite medicines cannot properly be taken in, on account of the continual vomiting. An inflammation of the diaphragm is in general more dangerous than the pleuriſy, both on account of the perpetual motion of the diaphragm, and of it's conſent with the heart and brain †. In fine, an inflammation of the womb, *ceteris paribus*, is obſerved to be more fatal than inflammations of the other viſcera; ſince it is moſt of all inclined to ſuppuration and gangrene, and frequently terminates in a mortal conſumption ‡.

5, The age, ſex, and conſtitution of the patient are by no means to be neglected. Thus even Hippocrates remarks, that, inflammations of the thorax more ſeverely afflict ſtrong and robuſt men, than thoſe, who live without exerciſe §. Hence, *ceteris paribus*, any inflammation is much eaſier cured in women and young men, than in ſtrong and laborious perſons, on account of the greater mobility of their fibres, and the inferiour denſity of their fluids ‖. In fine, for this reaſon, as is proved by Dr. Home, men generally labour under the encephalitis in a more ſevere degree, than women ¶.

6, Finally, great attention ought to be paid to the ſtate of the patient: for it is well known, that wo-

* L. 1, § 952, p. 228. † Quarin. l. 1, cap. 18, p. 339.

‡ Vogel, l. 1, t. iv, kapitel 23, p. 422.

§ *Coacæ Prænotiones*, ſect. ii, p. 181.

‖ Quarin, l. 1, cap. 13, p. 193. ¶ *Principia Medicinæ*, p. 103.

men

men with child and lying-in are more ſeverely affected, and leſs eaſily reſtored, in acute diſeaſes, than other ſubjects; and that the hump-backed, or thoſe who have a narrow cheſt, often labour under inflammations of the breaſt. The ſame is ſeen in men of a delicate and tender fibre, as an incurable phthiſis moſtly ſucceeds to the peripneumony in ſuch ſubjects, eſpecially if they have beſides an hereditary prediſpoſition to the conſumption. The ſlighteſt inflammation, though proceeding from an external cauſe, moſtly terminates in an ill looking ulcer in thoſe who labour either under the ſcurvy, or under any other cachectic diſeaſe. Quarin aſſerts, that a peripneumony happening to the phthiſical proves commonly fatal, and that, when ſucceeding to a dropſy of the cheſt, or, *vice verſa*, when ſuch a dropſy happens after the peripneumony, the diſeaſe is abſolutely mortal *. There are, notwithſtanding, ſome exceptions to this rule; as, according to the obſervations of the renowned phyſician Zimmermann, ſome who had been attacked by peripneumony when labouring under the dropſy of the cheſt, and, on the contrary, others, who had fallen into a dropſy of the cheſt after an inflammation of the lungs, were recovered by a proper method of treatment †.

In the fourth place, I have at length to explain, in how many ways the inflammation of any *viſcus* may become fatal. On conſidering this ſubject, it ſeems to me, that an inflammation can kill in ten different

* L. 1, cap. 17, p. 296.

† *Von der Erfahrung in der Arzneykunſt*, theil 1, lib. 3, kapitel 6, p. 363.

ways;

ways: 1, by convulsions; 2, by an apoplexy; 3, by suffocation; 4, by secretion of coagulable lymph; 5, by metastasis; 6, by gangrene; 7, by transudation; 8, by rupture of the vessels; 9, by an imposthume in the cavity either of the thorax or of the abdomen; 10, by effusion of the gall in the abdomen.

1, Death by convulsions happens in the commencement of an inflammation. Such an event owes it's origin either to the too irritable state of the patient, or to the irritability of the organs affected: for which reason this termination chiefly takes place in the inflammation of the brain, the stomach, and the intestines *. How death is induced by convulsions has been often enough explained above.

2, The patient is carried off by an apoplexy, either when the blood is retained in the brain, on account of the spasmodic contraction of the vessels; when the reflux of the blood from the brain is impeded by the swelling of the inflamed organ; or, in fine, when the brain suffers such a compression from secerned coagulable lymph, that a mortal apoplectic fit instantaneously ensues.

3, Death from suffocation may be occasioned, either by the inflammation of the *glottis* and the *epiglottis*, by which the opening of the *glottis* is closed; by the secretion of coagulable lymph filling up the whole windpipe, and thus blocking up the free passage of the air to the lungs; or, in fine, by an

* Van Swieten, l. l. t. iii, § 953: Stoll *Aphorif.* § 311: and Vogel, l. l, t. iv, cap. 1, p. 14.

impoſthume enſuing from a ſore-throat, which tumour either impedes the acceſs of air by it's bulk, or the rupture of it puts, as it were, in one moment an end to life by the abundance of purulent matter diſcharged.

4, The ſecretion of coagulable lymph is one of the moſt frequent conſequences of inflammations: indeed, that this ſecretion often happens, is proved by the frequent adheſions of the pleura to the lungs; of the pericardium to the heart itſelf; of the liver to different parts of the abdomen; of the omentum to the ſtomach; and by a membrane, two lines in thickneſs, obſerved by Dr. Burnſtiel between the dura mater and the brain, in a perſon to whom an inflammation of the brain had proved fatal *: all which ought to be looked upon as ſo many membranes, produced by the ſecretion of coagulable lymph. This ſecretion of coagulable lymph is not always ominous, but terminates differently, according to the different organs affected. Thus in the pleuriſy the diſeaſe is often luckily cured by this ſecretion, and the patient afterwards experiences no detriment from the adheſion of the parts. The inflammation of the abdominal viſcera indeed often terminates in a like way; but here it not unfrequently leaves troubleſome ſymptoms behind it in conſequence of the adheſions of the viſcera to each other. Laſtly, if this ſecretion of lymph take place in a large quantity, in an inflammation of the brain, or of the lungs, life is deſtroyed: in the firſt caſe, either by an apoplexy, or a ſphacelus of

* Burſerius, l. l, vol. 3, p. 402: Vogel, iv theil, p. 14, und. 148.

the

the brain, produced by it's compreſſion; and in the ſecond, by ſuffocation. Thus it appears, that this conſequence of inflammation ought to be conſidered as a ſalutary effort of the vital principle to vanquiſh the diſeaſe; though this effort is ſometimes followed by an unfortunate, and even mortal event.

5, The patient dies from a *metaſtaſis*, either when the morbid matter is of ſo pernicious a nature, that a ſphacelus of the afflicted organ is directly produced; becauſe the vital principle, already weakened, is unable to ſuſtain a new inflammation: or, when the noxious matter is transferred to organs, the ſtructure of which may be readily deſtroyed, and the function of which is abſolutely requiſite to life. The cauſe of death differs according to the different *viſcus* to which the *metaſtaſis* takes place.

6, I ſhall here ſay nothing of death from gangrene, having often ſpoken above of it's manner of killing, and, in the ſequel, I ſhall treat particularly of mortification and it's cauſes.

7, Tranſudation from the veſſels is juſtly ranked by the great Cullen among the events of inflammation*; ſince diſſections prove, that it happens much more frequently than is commonly believed. This tranſudation of the ſerum either ariſes in the laſt ſtage of the diſeaſe, when an univerſal relaxation of all the powers ſucceeding to the inflammation, the ſerum, as it were, ſweats through the gaping interſtices of the relaxed veſſels, in which caſe this effu-

* L. 1, vol. i, book ii, chap. 16, p. 240.

ſion of ſerum takes place in a great quantity *; or it is occaſioned by a violent degree of inflammation, when a ſalutary effort of nature cures the diſeaſe, by producing this effuſion of ſerum †; or, laſtly, when, without the leaſt inflammation, the veſſels, grown too turgid from plethora alone, loſe their tone, their coats, too much diſtended by the blood, recede from mutual contact, and thus the ſerum is diſcharged ‡. This event of inflammation, when ariſing from an univerſal relaxation of all the powers, is almoſt always mortal §; whereas, when occaſioned by the too great diſtenſion of the veſſels, it ſeldom brings on death, but moſtly changes either into dropſy of the cheſt, or into aſcites ‖. The cauſe of death is different, according to the difference of the organs in which the tranſudation takes place.

8, The inflammation is ſometimes terminated by a diæreſis, or rupture of the veſſels, which is chiefly produced by two cauſes. It happens in the firſt place, when the veſſels are broken by the violent preſſure of the column of blood, on account of their being in the higheſt ſtate of inflammation. Such a rupture chiefly takes place in the inflammations of the lungs, on account of the delicate ſtructure of their veſſels; though, I do not deny, but that it may alſo ſometimes happen in the inflammations of the other viſ-

* Stoll, *Rat. Med.* pt. i, *ſect.* 13, p. 148.

† Stoll, l. l. pt. i, p. 95 and 98.

‡ Stoll, l. l. pt. 3, cap. vi, p. 203.

§ Stoll, l. l. and Cullen, l. l. vol. i, book ii, p. 240.

‖ Stoll, l. l. pt. 1, ſect. ix, p. 128; Cullen, l. l. p. 241, and Morgagni, l. l. t. iii, lib. iv, epiſt. 211, art. xxxiv.

cera.

cera. The blood, in this caſe, is effuſed either into the wind-pipe, in which caſe a hemoptoe enſues. Dr. Eller has obſerved ſuch a termination of peripneumony in a vigorous young man, who nevertheleſs was reſtored to perfect health in three months *; or it is diffuſed in the cells of the lungs, in which caſe a ſuffocation is produced by the compreſſion of the lungs, and the impediment of their function. Haller confirms this by two examples †, and Cullen is of opinion, that this effuſion of blood chiefly conſtitutes the cauſe of death in thoſe who die from an inflammation of the lungs ‡. It occurs in the ſecond place, when the tone of the veſſels is greatly weakened; which may happen from different cauſes. Haller records ſuch a caſe of a lying-in woman, whoſe death ſeemed to have been occaſioned by an eryſipelas of the calf of the leg, but appeared to him, on the diſſection of the body, to have been the conſequence of an inflammation of the inteſtines, and eſpecially of an effuſion of blood into the cellular membrane through the whole length of the inteſtines §. The effuſion of blood from this cauſe is almoſt always fatal.

But though it ſeems probable from this obſervation, that a rupture of the veſſels may ſometimes take place from this cauſe, yet I cannot help obſerving upon this occaſion, that it has appeared to my worthy preceptor, the celebrated profeſſor Brugmans, from a great number of obſervations

* L. l. ſect. vii, p. 196 and 197.

† *Opuſc. pathol.* obſ. 14, hiſt. 1 and 2, p. 29 and ſeq.

‡ L. l. p. 239. § L. l. *obſ.* 83, p. 109 and 110.

made

made upon ſuch bodies, both of men and animals, that a diæreſis of the veſſels from this ſource much more ſeldom exiſts, than is commonly believed. Repeated experiments taught him, that when, at the firſt appearance, the colour and the internal ſurface of the alimentary canal ſeemed to indicate, that blood had been effuſed by diæreſis, a rupture of the veſſels nevertheleſs had not taken place, but that the minute blood veſſels of the inteſtines were then only turgid with this fluid, ſo that they broke after death, on the application of a very ſlight force*.

9, An impoſthume in the cavity, either of the thorax or the abdomen, belongs to the manner of dying from inflammation only when the abceſs is ſo large, that, on it's breaking, all the viſcera of the thorax or the abdomen are weltering, as it were, in the purulent matter. In the firſt caſe, the patient is carried off by a ſuffocation: in the ſecond, the cauſe of death differs, according to the different *viſcus*. In general, ſuch an impoſthume being broken, there enſue faintings, great relaxation of the powers, *meteoriſm*, and a gangrene, which extinguiſhes life; though the patients do not always die in the above manner, but ſometimes in a quite different way, and which is only explicable by the diſſection of the body, of which Dr. Macbride relates a ſtriking inſtance. A vigorous middle aged man became unawares attacked with a total ſuppreſſion of urine, and died in three days; the body being opened, no mark either of the ſtone or gravel appeared in the kidneys or the bladder; but all the

* *Rapport wegens den Staat der Veeziekte*, p. 20.

viſcera

viſcera of the abdomen were found weltering in purulent matter, which had flowed out of the ſpleen, the greater part of which was conſumed, and by the acrimony of which the bladder was very much contracted*.

10. In fine, when the liver, eſpecially it's concave part, is attacked by an inflammation, it is alſo not unfrequently communicated to the gall-bladder. If ſuch an inflammation terminate in a ſuppuration, the bile itſelf, together with the purulent matter, is often effuſed into the abdomen, and then the patients almoſt always die of ſphacelus of the inteſtines. In this caſe, a relaxation of all the powers, fainting, and meteoriſm are the forerunners of approaching reſolution†.

* L. l. Vol. ii, book ii, chapter vii, p. 182.

†. L. l. t. iv, chapter 19, § 30.

CLASS IX.

Death from Fluxes.

ORDER I.

The Fluxes of the Belly.

GENUS I.

Diarrhœa.

DIARRHŒA is a frequent, copious, and liquid diſcharge of the contents of the inteſtines. It is eaſy to perceive from this definition, by what marks the diarrhœa ought to be diſtinguiſhed from dyſentery, with which it is often confounded: for in the diarrhœa the flux is always obſerved to be copious; whereas, in the dyſentery, though the patient makes very frequent and painful efforts, they are almoſt ineffectual, ſo that, the *fæces* being retained, nothing is diſcharged except a little blood, and *mucus*, or *mucus* alone. This alone is the pathognomonic ſign, by which both theſe diſeaſes, when not combined together, may always be diſtinguiſhed: for it does not belong to the nature of the diarrhœa, that, as is commonly believed, griping pains ſhould be entirely wanting; ſince theſe may not only exiſt in a diarrhœa, according to daily experience, but ſometimes this diſorder is accompanied with a very violent pain. For inſtance, in the bilious fever, the bile

bile is not unfrequently found ſo acrid as to excite frequent, copious, and griping ſtools, whence even an erythematic inflammation of the inteſtines often ariſes.

All the different ſpecies of diarrhœa may, in my humble opinion, be readily reduced either to diarrhœas ariſing from ſome acrid ſtimulus, to habitual ones, or to colliquative fluxes; and I am the more inclined to this diviſion of diarrhœa, as the cure of the different ſpecies is already in ſome meaſure obvious from it. For, if the looſeneſs ariſe from a morbid ſtimulus, we ought always to endeavour at the removal, or at leaſt, the abatement of the ſtimulating power, by diluents, demulcents, opiates, and the occaſional exhibition of neutral ſalts, and other gentle purgatives. In the ſecond kind, we ſhould ſuccour the weak and irritable alimentary canal by means of tonics, aſtringents, and anodynes, of which the ſimaruba, caſcarilla, logwood, gum kino, alum, catechu, bark, rhubarb, and opiates, are the chief. Emetics likewiſe may be advantageouſly uſed, as vomiting produces ſome inverſion of the periſtaltic motion. In the colliquative fluxes the diſeaſe is for the moſt part above the power of phyſic, becauſe ſuch diarrhœas, as are effects of a greater or leſs degeneration of the ſtructure of the inteſtines, moſtly prove mortal; and a palliative treatment, by the remedies we have recommended for the habitual diarrhœa, is all, in general, that can be expected from the phyſician.

Diarrhœa kills in three ways; by a fainting, an inflammation of the inteſtines, and a colliquative flux.

In the firſt caſe the vital powers, on account of the very copious and frequent ſtools, become ſo weakened, that at length the heart itſelf, overwhelmed with blood, and unable to propel it, falls into a mortal fainting. I have already ſhown how the inflammation of the inteſtines, and the colliquative flux, bring on death.

GENUS II.

Dyſentery.

A DYSENTERY is a frequent, ſmall and painful diſcharge of the belly, attended with teneſmus. It may be either mucous, or bloody; and is moſtly attended with ſome degree of pyrexia.

As the dyſentery is a diſorder, which is not only frequently met with in private practice, but more eſpecially prevails in armies, where it often proves one of the moſt deſtructive enemies of which the britiſh army on the continent, under the command of His Royal Highneſs the Duke of York, in 1794, was a remarkable inſtance, I intend to treat a little more fully of this diſeaſe. I ſhall ſpeak therefore, 1, of the nature of the dyſentery; 2, of it's ſeat; 3, of it's complications; 4, of it's cure; 5, how *opium* remedies the dyſentery; 6, of it's contagion; 7, of it's prevention; and 8, of it's manner of killing.

As to the firſt. I look upon the ſimple dyſentery as a catarrh of the inteſtines, which is produced in two ways: either the catarrhal matter is ſecerned by the ſpecifically affected veſſels of the inteſtinal coats; or, when already generated in another part of the body, it is tranſlated to the coats of the inteſtines.

The reaſons, why following the footſteps of Stoll and Richter, I conſider the genuine or ſimple dyſentery as a catarrh of the inteſtines, are principally the following.

1, The dyſentery ſcarcely ever appears except in that ſeaſon of the year, in which catarrhal affections are moſt prevalent, which ſeems to ſhow, that there exiſts a great affinity between theſe diſeaſes.

2, Catarrhal affections very often precede the dyſentery, which, on its ariſing, immediately diſappear; as not only the illuſtrious Richter has demonſtrated by many inſtances *, but alſo Dr. Stoll has frequently obſerved, that the rheumatiſms of the extremities are inſtantaneouſly removed, on the ariſing of a dyſentery †. Beſides, it is proved from the diſſertation of the celebrated ſir George Baker, that the catarrh, which was epidemic in England, in the year 1762, changed in the commencement of the autumn, into dyſentery, which, conſidering the different ſeat of the diſeaſe, and the different function of the affected parts, was perfectly

* L. 1. kapitel, p. 87. † L 1. p. 187.

of the ſame nature *, an unequivocal proof, that the morbid ſtate was not in the leaſt different in the two diſeaſes.

3, On the other hand, catarrhal affections of the other parts ariſing, the dyſentery quickly ceaſes. Richter relates, that a dyſentery was removed by a ſupervening ſore-throat †, and Stoll has often witneſſed, that it diſappeared on the ariſing of rheumatic pains in the extremities ‡.

4, Stoll remarks, that at the ſame time of the year both theſe diſeaſes are equally frequent, ſo that ſome are attacked with the rheumatiſm, and others with the dyſentery §; which manifeſtly proves, that theſe morbid affections are produced from one and the ſame noxious power, and that they differ only by attacking different parts in different ſubjects.

5, Sydenham calls the dyſentery, "the fever of "the ſeaſon turned in upon the bowels ‖," on account of the ſenſible diminution of the fever upon the appearance of this diſtemper. Sir John Pringle ſays, "frequently, the beginning of a flux will have "the appearance of the autumnal fever; for the pa- "tient will be feveriſh with a diſorder in his ſto- "mach and bowels, for two or three days before "the purging comes on; but after that the fever "ſenſibly gives way. At other times, upon fatigue,

* See *Sandifort Theſaur. Diſſert.* t. ii, p. 365 and ſeq.

† L. l. p. 89. ‡ L. l. p. 187 and 201. § L. l.

‖ Febrem eum eſſe (ſui ſcilicet generis) in inteſtina introverſam deprehendi, l. l, de *Morb. acut.* ſect. iv, cap. iii, p. 182.

"and

" and expoſition to cold, during the dyſenteric " ſeaſon, the men will be more ſuddenly ſeized with " the flux; but ſeldom without ſome degree of " fever *:" All which obſervations leave not the leaſt doubt, but that the dyſentery is a catarrhal affection of the bowels.

6, If, in fine, I add to all this, that the dyſentery, as to it's ſymptoms, thoſe alone excepted, which immediately depend upon the affected part, and alſo as to it's complications, perfectly agrees with the other catarrhal diſorders, I have not the leaſt doubt, but that the dyſentery belongs to them.

As to the ſecond. This catarrhal matter principally affects the ſmaller inteſtines, and produces in them a ſpurious inflammation, often running into gangrene, which, if not ſoon remedied, terminates in ſphacelus. That the ſmaller inteſtines, and the rectum, chiefly labour under dyſentery, is not only proved by ſound reaſoning; as it is evident, that the great inteſtines deſtined for keeping the *fæces* are much leſs eaſily affected by the morbid ſtimulus, than the ſmall ones; but is beſides confirmed by this, that the griping pain in the dyſentery almoſt always occupies the middle of the abdomen, the natural ſeat of the ſmall inteſtines. In the bodies of more than forty perſons deſtroyed by the dyſentery, which I had an opportunity of examining after death, I found the ſmall inteſtines ſeized with a ſevere inflammation, which had already partly terminated

* L. l. pt. 3, chap. vi, p. 226.

in mortification; whereas the cœcum and colon either exhibited nothing preternatural, or at moſt were ſometimes here and there ſlightly inflamed. It is well known, that, on the contrary, Pringle, Stoll, Baker, and Baillie have found the great inteſtines alone affected, and the ſmall ones either in their natural ſtate, or only in a ſlight degree injured. The obſervations of theſe eminent phyſicians ſeem thus to be quite contrary to my own: a difference which cannot be accounted for, but by taking for granted, that in the different epidemics, and in different ſubjects, the diſeaſe makes it's attack on different parts of the alimentary canal; though I am diſpoſed to believe, both from my own obſervations and the ſymptoms of the diſeaſe, that, in the ſimple dyſentery, the chief ſeat of the diſorder is in the ſmall inteſtines, and in the rectum.

This catarrhal affection, when attacking the great inteſtines, though it does not in general kill ſo ſoon, but is protracted during a longer ſpace of time, does not afford a more favourable prognoſis: for, if not checked in the beginning by proper treatment, it either terminates in gangrene, or reduces the inteſtines into ſuch a ſtate, that though the dyſentery ceaſes, the patients die of the depraved ſtate of the bowels; for a colliquative flux, accompanied with a hectic fever, ſucceeds to the dyſentery in ſuch caſes, by which the remainder of the powers are gradually broken, and death ſlowly arrives. In ſuch bodies, Stoll, Pringle, Baker, and Cleghorn found the inteſtines, eſpecially the great ones, thicker than uſual, hard, and coriaceous, and in ſome

ſome they ſaw ſcirrhous tubercles ſtraitening the cavity of the colon in ſeveral places *.

It has been generally ſuppoſed, that this catarrhal inflammation of the inteſtines terminated in an ulcerating proceſs, and that the ulcers of the inteſtines brought on the dyſentery; this, however, is not the fact; the contrary is proved both by the obſervations of Pringle and Stoll, and by my own, for I never could detect even the ſlighteſt ulceration, either in the great or ſmall inteſtines. I, therefore, believe, that when upon examination after death ulcers ſometimes have been found in the inner membrane of the inteſtines, ſuch appearance was occaſioned by ſome accidental cauſe, and by no means owing to the nature of the dyſentery.

As to the third. It has been already obſerved that the dyſentery does not always appear under the ſame form, but exhibits various ſymptoms, according to it's different complication; for a complicated dyſentery is a diſeaſe compounded of the dyſentery itſelf, and the morbid condition united with it; therefore the ſymptoms eſſential to a dyſentery are indeed not wanting, but there exiſt with them others, which owe their origin to the morbid condition complicated with the dyſentery: theſe differ greatly according to the various complications. The dyſentery may be combined with ſordes of the firſt paſſages, with an inflammatory, bilious, and putrid ſtate, and nervous ſymptoms.

* Stoll, *Rat. med.* pt. 3. ſect. iv, p. 191 and 199. Baker, l. l, p. 381. Pringle *on the Diſeaſes of the Army*, pt. 3, chap. vi, § ii, and Cleghorn, l. l. chap. v, p. 227.

Sordes

Sordes of the *primæ viæ* are moſt commonly joined with the dyſentery; and they are almoſt always met with, even in a ſimple dyſentery, in farmers, and hard working people, from their manner of living, though the ſeaſon of the year, and the epidemical conſtitution, not ſeldom contribute to this complication; which is nevertheleſs the leaſt of all to be feared, and can be readily gotten the better of.

The other complications are more dangerous, yet their cure, in general, is not very difficult, if they be ſimple, if they attack ſound bodies, and if, in fine, they be oppoſed, at the commencement of the diſorder, by proper remedies. If neglected, however, they commit great ravages. The complication of the dyſentery with the putrid fever indeed is to be excepted, as this ſometimes proves very difficult to be remedied, and, if not treated in a proper way, ſoon terminates fatally. I ſay, if the morbid conditions, complicated with the dyſentery, be ſimple; ſince diſeaſes already complex in themſelves by their conjunction with the dyſentery produce a very complicated diſeaſe, and, for this reaſon, ſcarcely yield to any treatment.

The danger of the dyſentery differs therefore, according to the nature of the morbid ſtate with which it is combined. This complication of dyſentery depends in a great meaſure on the reigning epidemic: thus, for inſtance, the dyſentery, which was epidemical in England in the year 1762, was bilious inflammatory, yet, when properly treated, it proved fatal to but few*. The dyſentery epi-

* Baker, l. 1. p. 374.

demic

demic at *Vienna* in the year 1776 was bilious, and, when not ſoon cured, changed into a putrid one*. The dyſentery, which ravaged *Gelderland*, and ſome other of the United Provinces in the year 1783, partook likewiſe of the putrid ſtate†. The celebrated Dr. Frank obſerved lately an epidemic dyſentery partaking of a ſtrong inflammatory nature, in which all ſtimulants proved hurtful, and which gave way only to the free uſe of the lancet and the antiphlogiſtic plan of treatment‡. In fine, the dyſentery epidemical in *Auſtria* in 1777 was very complicated, being of a putrid inflammatory nature, accompanied, in many ſubjects, with nervous affections. This dyſentery proved mortal to many, eſpecially to weak and cachectic perſons, as, on account of the complicated ſtate of the diſeaſe, neither an antiphlogiſtic treatment, emetic purgatives, tonics, nor anodynes, were able to cure or even to palliate the diſeaſe§. The great obſerver of nature Sydenham, though improperly criticiſed on this ſubject by Dr. Pringle‖, was already conſcious of the great influence of the epidemical conſtitution in modifying the dyſentery. Therefore, he queſtions, whether there may not be as many kinds of this diſtemper, as of the ſmall-pox, and other epidemics, which vary ſo much as, in ſome reſpects, to require a different method of cure.**

* Stoll, l. l. cap. ii, p. 183, et cap. vii, p. 218.

† Van Geuns, l. l. p. 12.

‡ *Ratio Inſtituti clinici ticinenſis, in prefatione.*

§ L. l. cap. iv, p. 191. and cap. ix, p. 230.

‖ L. l. p. 222.

** L. l. p. 189, and 181.

As

As to the fourth. The cure of a ſimple dyſentery may not unfrequently be performed by a mild diaphoretic, ſuch as the flowers of the common elder, and Dr. Tiſſot has often cured ſuch dyſenteries by giving large draughts of tepid water alone*. Though the ſimple dyſentery cannot always be ſo eaſily removed, yet, an emetic and afterwards a purgative being premiſed, opium always performs the cure; and ſo ſoon, that the patients are reſtored to their former health within a few days†. Thus the ſimple dyſentery is a mild diſeaſe, and there exiſts no example, that I know of, of it's having proved fatal, when a proper mode of treatment has been adopted in the commencement of the diſeaſe. Nay that the cure of this diſeaſe is, in the beginning, eaſy to be performed, is proved even by the obſervations both of Cleghorn and Pringle; the firſt of whom mentions, that "Almoſt all the dyſenteries, which fell under his "obſervation, unleſs ſpeedily cured in the beginning, at beſt proved obſtinate, and too frequently fatal‡;" and Pringle ſays, that "The "learned Senac acquainted him, that having had "good evidence for believing, that ſeveral had "been cured by taking nothing, but large quantities of warm water, for five or ſix days together, he had ſucceſſively made the experiment "upon himſelf, and upon fourteen more, who "ſubmitted to that regimen. He added, that "after having tried other methods, without being

* *Raadgeeving voor de Gezondheid van den gemeenen Man*, cap. xxv, p. 269.

† Richter, l. l, kapitel v, p. 105. ‡ L. l. p. 228.

"ſatisfied

" ſatisfied with any of them, he had at laſt fixed " upon the following, by which he had made " numberleſs cures. This, after evacuating by " bleeding, and by a vomit of emetic tartar, con- " ſiſted chiefly in giving one grain of that anti- " monial preparation diſſolved in a pint of com- " mon whey, or chicken-water, in divided draughts, " every day, for all food, drink, and medicine, " till the patient recovered*:" which evidently ſhows, both, that the dyſentery obſerved by Sir John Pringle, as well as all the others, was of a mild nature, when not complicated with any other diſeaſe, and that the opinion of this eminent phyſician, that the internal prediſpoſing cauſe of a dyſentery is a putreſcent ſtate of the blood, is quite erroneous†. For, not to mention that daily experience proves, that many, without having the leaſt mark of any tendency in the blood to diſſolution, are ſeverely attacked with the dyſentery, it is evident, that neither bleeding, an emetic, nor warm water, whether alone, or together with a ſmall doſe of emetic tartar, can by any means correct a putreſcent ſtate of the blood; nay, on the contrary, theſe remedies would promote it, if exiſting. This, then, is a freſh argument to prove, that a ſimple dyſentery is nothing but a catarrh of the inteſtinal coats, which may be removed, at leaſt in it's commencement, by a gentle diaphoretic, ſuch as tepid water. All the danger of the dyſentery, therefore, depends either upon the epidemic, the peculiar diſpoſition of the ſubject, or improper treatment. We ſaw before, that the moſt parti-

* L. 1. p. 277. † L. 1. p. 252.

cular attention ought to be paid in the cure to the reigning epidemic, which is farther confirmed by a remarkable inſtance recorded by Stoll; who relates, that, in the year 1778, during an inflammatory epidemie, he had the care of a girl eighteen years old, in whom, on account of the conſtitution of the body, and a depraved taſte, he ſuſpected ſordes of the *primæ viæ*, to remove which he preſcribed an emetic purgative; but with ſuch an unhappy effect, that, all the ſymptoms growing worſe, ſhe ſoon died*.

Though this inſtance proves, how much attention is to be paid to the epidemic in the cure of the dyſentery, ſtill the different conſtitutions of the patients ought always to be kept in view; for, on account of theſe, they ſometimes require a manner of treatment not agreeing with the reigning epidemic. Thus, for inſtance, in an epidemic wholly averſe to bleeding, veneſection may yet be uſeful in the plethoric, on account of the too great orgaſm of the blood; whereas, in an inflammatory epidemic, the blood ought to be ſparingly drawn in weak and cachectic bodies: and, truly, if Stoll be to be reprobated in any thing, it is in this, that, attending carefully to the epidemical conſtitution, he generally paid little or no regard to the different temperaments of his patients.

It appears then, that the cure of the dyſentery muſt be different, according to the different morbid ſtate united with it, and that of courſe no certain

* *Rat. Med.* pt. iii, cap. xi, p. 233.

rules

rules can be laid down for it's cure. Accordingly, if, for inſtance, the dyſentery be of an inflammatory kind, recourſe ſhould be had to bleeding, and the whole of the antiphlogiſtic plan; by which means the inflammatory condition being removed, the complicated dyſentery is changed into a ſimple one, to which the exhibition of opium will now quickly put a ſtop. If, on the contrary, a bilious or putrid ſtate be complicated with the dyſentery, bleeding ought to be avoided, and vomits and neutral ſalts are to be given previous to the uſe of opium. Laſtly, if the dyſentery be joined with nervous ſymptoms, the bark, contrayerva, ſnake-root, and wine, may occaſionally be exhibited along with opium, with benefit to the patients.

But it is greatly to be regretted, that the circumſtances by no means always permit us to go on ſo methodically with the treatment; for frequently we are called in, when the moſt immediate danger is imminent, and the patient's life entirely depends upon our manner of proceeding; ſo that if the proper opportunity of checking the complaint be loſt, death is often uſhered in within a few hours. If, therefore, the diſeaſe increaſe, the griping pains and teneſmus become more violent, the face turns pale, the eyes ſink in, the pulſe be weak and intermittent, and a great debility, attended with coldneſs of the extremities, hiccup, and cold ſweats, come on; in a word, in all caſes, wherein the urgency of danger is great, and the ſymptoms indicate an approaching gangrene of the bowels, the phyſician ought always to have recourſe to opium; which remedy is to be given not in ſmall but in large doſes, and is the only

one,

one, that is able to put a ſtop to the complaint, when of a more alarming nature.

Moſt phyſicians, though they allow, that opiates do a great deal of good in dyſentery, are yet of opinion, that, previous to their uſe, the *primæ viæ* are to be well cleanſed by the exhibition of neutral ſalts diſſolved in a large quantity of water for ſeveral days. Such a manner of proceeding may in moſt caſes be unattended with danger in private practice, eſpecially if the practitioner have been called in when the diſeaſe firſt makes it's appearance; but it would by no means be ſafe in the dyſenteries happening in the navy and army; which are moſtly of ſuch ſevere kinds, that they would terminate fatally before the *primæ viæ* were properly evacuated by the neutral ſalts. Upon the whole I am very much inclined to doubt the propriety of ſuch a treatment. For my own part, without loſing time by repeated evacuation of the *primæ viæ* by the ſolution of neutral ſalts, I immediately give an emetic of ipecacuanha, if the ſtomach ſeem to be at all affected; after which I give my patients the mercurius dulcis from gr. v ad gr. xii, in order to evacuate properly the bowels at once; and then I proceed to the antidote of dyſentery, opium. The calomel not only cleanſes the *primæ viæ*, but it ſeems to have ſomewhat of an antidyſenteric power; for it may be exhibited even to the moſt delicate conſtitutions with perfect ſafety, and frequently under it's uſe the gripings and pain abate. If, therefore, during the uſe of opium, ſordes in the *primæ viæ* ſhould appear, recourſe is occaſionally to be had to mercury.

The

The utility of opium in the dyſentery, under ſuch conditions, was long ſince known to phyſicians. Sydenham, treating of the dyſentery, ſays, " Never-
" theleſs, it ought carefully to be attended to, as a
" mean of ſnatching many from the jaws of death,
" that, as often as the gripings of the belly are con-
" tinued to a confirmed dyſentery, I am convinced,
" that it is very dangerous to oppoſe the diſtemper
" in the round about manner of evacuating, and
" afterwards palliating. As I have experienced,
" that the dyſentery will be cured in the moſt certain,
" and quick way, if, laying aſide all this circuitous
" practice, the flux be immediately ſtopped with
" laudanum: for this diſeaſe is ſo grievous, and
" violent, that, if, when the dyſentery is already
" confirmed, you ſtill endeavour to purge, it is
" much to be feared, that, on account of the vital
" powers being thence more weakened, the dyſen-
" tery will either torment the patient longer, or
" kill, whatever treatment you may afterwards
" purſue. Therefore, when ſent for, I immediately
" exhibit laudanum as far as twenty-two drops,
" twice within twenty-four hours, or oftener, at
" regular intervals, if the above doſe have not been
" ſufficient to check the gripings, and ſtools *."
The learned Dr. Ramaſſini ſpeaks of the uſe of opium in the following way: " Perhaps there is no
" diſeaſe, in which opiates may be given with more
" ſecurity, and in a greater quantity, than in this
" diſtemper, though the powers are almoſt worn
" down and exhauſted. To a perſon labouring
" under the moſt violent dyſentery, I gave at dif-

* L. l. *Sced. Monit. de nov Febr. Ingreſſu*, p. 351 et 352.

" ferent times opium as far as three or four " grains, but with little benefit. He had re- " mained during many days totally cold, and " without pulse; the vital powers nevertheless " were not so languid, but he could move himself " to and fro; but I was afraid, that the opium, " if taken in a larger dose, might extinguish the " remains of the vital flame: however, I again gave " it to five grains, from which dose the patient " quietly slept, and became warmed *." In fine, the following are the words of the accurate investigator of the powers of opium, the celebrated Tralles: " I would not attempt the cure of a severe dysen- " tery without opium, or have I ever seen such a " one cured without this excellent gift of the Divi- " nity: no more proper remedy for this disease can " be invented by mankind, as it is it's most certain " antidote, justly called so by Bontius †."

These encomiums of opium in the dysentery are wholly corroborated by the observations of the moderns: thus, in the dysentery, which was epidemical in Friesland, and in the neighbouring countries, in 1779, the evacuating plan recommended by Degner, Pringle, Tissot, and Zimmermann, being tried in vain, the physicians had recourse to the treatment recommended by Sydenham, by which most of their patients were recovered ‡. In this dysentery the learned Dr. Stinstra gave opium as far as eighteen grains, and the surgeon Leinsius as far as thirty six, within twenty-four hours, with the desired success. A lady, whose extremities were already cold,

* *Opera omnia const. Epid.* § 33, p. 201 et 202.

† *Terres Remed. Exam. rigid.* p. 168.

‡ *Acta Hagana*, vol. i, pt. i, a p. 983, ad 1008.

having

having taken at once ʒi of *laud. liq. Sydenh.*, was reſtored to perfect health *. Profeſſor van Geuns adminiſtered in the dyſentery opium as far as twelve grains, within twenty-four hours, with the ſame benefit †. In fine, I can add my own obſervations to thoſe of other phyſicians, as I have ſeen about two hundred ſnatched from the jaws of death by the uſe of large doſes of opium.

Opium is thus to be given in large doſes, when the ſymptoms are urgent; for ſmall doſes of opium, though they often bring relief in a mild dyſentery, yet, when the diſorder is of a more ſevere kind, are not capable of performing the cure, and I have frequently ſeen the complaint exaſperated by their uſe. The doſe in which opium is to be taken ought, however, to be comparatively ſmaller or larger, according to the urgency of the complaint, the conſtitution of the patient, and the nature of the reigning epidemic; ſo that no quantity to be uſed in a certain time can be determined. Though in general dyſenteric patients bear very well ſtrong doſes of opium without any bad effects, yet now and then, we are told, it operates like a poiſon, and excites an unuſual tendency to ſleepineſs. If therefore on account of the imminent danger of life, recourſe muſt be had directly to very ſtrong doſes of opium, the patients are continually to be watched; and, ſuppoſing ſleepineſs ſhould come on, they are at any rate to be kept in continual motion, and by no means ſuffered to ſleep. By theſe means, though opium was impru-

* L. l. p. 991, 995, 1007, et 1008.

† L. l. p. 35 et 36.

dently exhibited in too large a dose, yet the life of the patient might always be saved. I know several cases of persons, who took large doses of opium in order to destroy themselves, some as far as a drachm, and nevertheless, by the exhibition of an emetic, and by keeping them in continual motion, the bad effects of the poison were prevented from taking place. I thought it necessary to mention this caution, when opium was directly given in a very strong dose, though I am inclined to believe, that, paying proper regard to the patient, and carefully observing what effects the opium given has on the constitution, such an event would never happen even from the largest dose the most severe dysentery requires for it's cure. In fine, it is to be observed, that children comparatively cannot bear such strong doses of opium as adults: and the practitioner ought the more to be on his guard in administering opium to them, as, if unluckily the symptoms of an overdose of opium take place in children, we do not possess the same means of saving their lives as those of adults; for in them life is sooner destroyed, and the remedies we have spoken of to prevent the bad effects of opium do not operate so effectually. As soon as the complaint is mitigated, the opium is to be given in smaller doses, for in the same degree as the bowels return to their healthy state the patients become likewise more susceptible to the stimulus of opium, so that, if the practitioner go on with administering large doses of opium, he is liable often to do a great deal of harm. Not to mention, that, the use of opium being continued for a long time, the patients become so accustomed to it, that they feel themselves uncomfortable without opium.

opium. The convaleſcent require it for a long while, and cannot but by degrees be weaned from it's uſe, of which there have been many inſtances *.

As to the fifth: Phyſicians ſtill diſpute, in what manner the opium operates in the dyſentery. Moſt are of opinion, that it acts by it's diaphoretic power: but though I readily grant, that it's diaphoretic virtue may ſomewhat contribute to it's effects, and would be quite ſufficient to cure a ſlight dyſentery, yet when it is conſidered, that many medicines, not inferior to opium in diaphoretic virtue, are not in the leaſt efficacious in a ſevere dyſentery †; that opium, taken when the gangrene of the inteſtines is coming on, prevents it, and acts as an excellent tonic; I cannot embrace this opinion. On the contrary, the efficacy of opium in this diſorder ſeems to me to be rather owing to a ſpecific power, by which it either prevents, or, when already exiſting, ſtops the gangrene communicated to the inteſtinal coats by the catarrh. This opinion ſeems to be confirmed, on comparing the gangrene of the inteſtinal coats produced by the dyſentery with the gangrene obſerved by the learned Pott; as a great analogy exiſts between theſe two ſpecies of gangrene: for a grievous pain is obſerved in both; hot and ſtimulating medicines prove hurtful; both ſpecies elude the powers of the bark, and the other antiſeptics; both gain ground quickly in ſome ſubjects, in others ſlowly; a great, and nearly equal quantity of opium is requiſite for curing both; in

* *Act. Hagan.* vol. i, pt. i, p. 1009.

† *Act. Hag.* l. l. p. 996.

fine, the patients are able in both to bear conſiderably large doſes of opium, without ſleepineſs, or any other injurious effect *. Now the gangrene deſcribed by the celebrated Pott, though he does not determine it's cauſe, ſeems to have been of a catarrhal origin; for Mr. Mulder, an eminent ſurgeon, obſerved in ſeveral dutch ſailors, after a malignant catarrhal fever, a gangrene perfectly agreeing with that mentioned by Pott in it's external appearance, in it's ſymptoms, in it's cure, and in every point †.

The following inferences may be drawn from what I have ſhown above:

1, That the dyſentery, by itſelf, is always a mild diſorder, and only becomes dangerous and mortal by it's conjunction with the reigning epidemic, or with ſome other morbid ſtate.

2, As the cauſes, which render the dyſentery fatal, are very different, it follows of courſe, that no ſpecific can be invented for the dyſentery; though opium may juſtly be conſidered as ſuch in moſt caſes.

3, The reaſon, why Degner, Pringle, and Tiſſot, are miſtaken, with regard to the dyſentery, is only, becauſe they drew general rules from one epidemic, and conſidered the ſymptoms of a complicated diſeaſe, as ſo many characteriſtic marks of the dyſentery.

* See the dutch tranſlation of Potts' Remarks on the Palſy of the lower Limbs, with the notes of my worthy preceptor, profeſſor Du Pui.

† L. l. part ii, p. 83, et ſeq.

4, As

4, As the catarrh of the inteſtinal coats, or the dyſentery, has a ſtrong tendency to gangrene; and, as it is obſerved, that all hot and ſtimulant medicines promote this propenſity; it may be concluded, *a priori*, from ſound reaſoning alone, that the uſe of rhubarb muſt be hurtful in the beginning of this diſeaſe. This is perfectly confirmed by the obſervations of practitioners. Dr. Huck aſſerts, that ſalts and manna are a better purge than rhubarb in the beginning of the dyſentery; and moſt of the engliſh phyſicians employed in Germany during the war, in 1756, experienced the ſame *. Sir George Baker notes, that rhubarb ought to be totally laid aſide in the commencement of this diſtemper †. Dr. van Geuns is of opinion, that this remedy ſuits the end better than the beginning of the dyſentery ‡. The eminent phyſician Stinſtra declares, that rhubarb has only injurious effects §: and the illuſtrious Richter not only agrees with him, but is of opinion, that no purgative does more harm in the beginning of the dyſentery, than rhubarb; and mentions ſeveral caſes, in which the patients had died of gangrene in the bowels, contracted merely by the uſe of rhubarb ‖. Therefore rhubarb is to be omitted in the commencement of the dyſentery, and ought only to be made uſe of towards the end of the diſeaſe, to ſtrengthen the *primæ viæ*.

5, As aſtringents do not in the leaſt prevent or cure the propenſity of the inteſtines to inflammation,

* Pringle, l. l. § 4, p. 266.
† L. l. p. 376.
‡ L. l. p. 38.
§ *Act. Hagan.* l. l. p. 985.
‖ L. l. p. 98.

or gangrene; but, on the contrary, by their ſtimulating power, rather promote it: as beſides, in the complicated dyſentery, they prevent the diſcharge of the noxious matter; all aſtringents ought during the courſe of any dyſentery to be avoided with the greateſt care, and they ſhould only be given to fortify the alimentary canal, when the dyſentery is already vanquiſhed. Indeed all reaſonable phyſicians agree, that, if aſtringents be uſeful, it is only when a laxity and debility of the bowels remain after the diſeaſe.

6, In fine, as to the uſe of the demulcent, and oleous medicines, ſo ſtrongly recommended in this diſeaſe, the demulcent can never injure, and prove uſeful in many caſes, to abate pain and violent gripings; the oleaginous remedies on the contrary are not only uſeleſs, but alſo frequently hurtful: for they often adhere to the inteſtinal plicatures, contract rancidity, and excite grievous pains, remaining even a long time after the dyſentery is vanquiſhed, and ceaſing only when the rancid oil is evacuated *. Conſequently we ſhould never have recourſe to oily medicines in the dyſentery.

As to the ſixth: Moſt phyſicians ſtate as an axiom, that the dyſentery is a contagious diſorder. I am ſorry to be here again obliged to recede from the common opinion, as the following arguments ſeem to prove, that the dyſenteric contagion is a mere product of the fancy.

* *Act. Hag.* l. l. p. 1000.

1, The

1, The mode of operating of the dyſentery is quite different from the way in which all contagions are communicated to the animal body. For theſe, being either applied to the lymphatic veſſels, are not taken up before a certain aſſimilation is produced between them and the abſorbents; or they are immediately communicated to the blood, and thus exerciſe their noxious effects; whereas the dyſentery acts in a quite different way: indeed, what excites this diſtemper is by no means abſorbed, or does not enter the blood, but is for the moſt part communicated directly to the inteſtinal coats from the atmoſphere, and thus produces the dyſentery. This diſorder then differs from all contagions, both in it's manner of acting, and ſymptoms.

2, The clothes, bedding, and other articles of houſhold furniture, which thoſe who died of dyſentery had made uſe of in the moſt ſevere epidemic of Harling, did not occaſion the leaſt bad effects, when ſold to other perſons, without any previous cleanſing *. Now it is well known, that all theſe ſpread the contagion of infectious diſeaſes.

3, All contagions whatever may indiſcriminately ſhow themſelves during the whole year: on the contrary, I do not know that the dyſentery ever appears, except towards the end of the ſummer, and in the beginning of the autumn.

4, The dyſentery ſeldom enters the houſes of the rich, at the ſame time, that it rages greatly among

* *Act. Hagan.* l. l. t. i, p. 951.

the

the loweſt of the people, as is noted by all the authors, who have written on this diſorder *: whereas all contagions equally affect all ranks from the palace to the cottage. An evident token, that the dyſentery is not a contagious diſeaſe.

5, The nature itſelf of the dyſentery demonſtrates, that it is not infectious: for I have above proved, that it is an inteſtinal catarrh, and it is well known, that the catarrhal affections are indeed epidemic, but not contagious.

6, The renowned Dr. Zimmermann has obſerved, that the dyſentery chiefly ſeizes perſons, whoſe perſpiration is often ſuppreſſed, on account of their manner of living, and that, therefore, it is more frequently met with among farmers, and common people †. He afterwards ſays, that, according to the obſervations both of the learned Mohrlin, and himſelf, thoſe had principally eſcaped the dyſentery, who, having avoided errours in diet, had farther abſtained from large draughts of cold water, when the body was hot, and who had kept up an uninterrupted perſpiration day and night ‡. Dr. Stoll has obſerved the ſame §. Now it would be difficult to explain, how a contagion is contracted on account of the perſpiration being ſuppreſſed, and how, on the contrary, it may be prevented by promoting perſpiration.

† Baker, l. l. p. 379: *Act. Hagan.* l. l. p. 947: Van Geuns, l. l. p. 85: and Degner *Hiſtoria Medica de Dyſenteria bilioſo-contagioſa*, p. 27.

† *Von der Ruhr*, p. 34. ‡ L. l. p. 77.

§ *Rat. Med.* pt. 3, p. 225.

7, Though

7, Though the illuſtrious Pringle admits, in ſome degree, the infection of this diſeaſe, ſtill he agrees, that the dyſentery is of a leſs infectious nature, than any of the other contagions *; and it may even be concluded from his own obſervations, that the dyſentery is not in the leaſt infectious: for he ſays, that, " As conducive to the cure, and as a pre-" ſervative againſt a relapſe, eſpecially when the " weather begins to grow cold, the convaleſcent " ought to be provided with under-waiſtcoats;" and that, " ſome of the officers, who had been " ſubject to returns of the flux, had informed him, " that they had found much benefit from wearing " a flannel waiſtcoat next their ſkin †." Now as a flannel waiſtcoat can have no other effect, than to keep up an uninterrupted perſpiration, it is evident, both that the dyſentery is nothing but a catarrh of the inteſtinal coats, and that it's contagion is merely imaginary.

8, Neither are there wanting practical obſervations, which refute the opinion of dyſenteric contagion. The immortal Sydenham does not mention any infection, that attended the epidemic deſcribed by him: and the eminent phyſician Willis expreſsly ſays, that the dyſentery he obſerved, and which was the ſame of which Sydenham ſpeaks, was not infectious ‡. The learned Vander Haar obſerves, that the dyſentery is not conveyed by infection from the ſick to the ſound, as is commonly believed; but that it is only propagated on account of the

* L. 1. p. 255. † L. 1. p. 286.

‡ *Pharmac. Ration.* ſect. 3, cap. 3.

epidemic,

epidemic, and the condition of the air which favours it *. In fine, the celebrated Stoll ſpeaks thus on the ſubject. " There are only a few, who queſ-
" tion the dyſenteric contagion; and moſt phy-
" ſicians are of opinion, that this effluvium may be
" communicated from the ſick to the attendants.
" I am really ſurpriſed, how we the phyſicians, the
" aſſiſtants of the phyſicians, and the nurſes, have
" remained free from the dyſentery, during ſo many
" years: although we every day looked at the *fœces*
" diſcharged the preceding night, and even, in ſpite
" of ourſelves, ſmelled the ſtinking effluvia †."

9, I can aſſert from my own experience, that the dyſentery is by no means an infectious diſeaſe. For, in the year 1794, during an epidemic camp-dyſentery among the hanoverian troops, which formed a part of the britiſh army under the command of his Royal Highneſs the Duke of York, and had their military hoſpital at that time at Leyden, I daily viſited the patients in company with thoſe, to whom their cure was committed; I breathed the air filled with the effluvia of the patients during a long time, nay there was ſometimes ſuch an offenſive ſmell in the wards, that it was with difficulty I breathed at all; and, at laſt, it is true, I contracted a ſevere cough, but remained free from the dyſentery, as well as my worthy preceptor the celebrated Dr. Brugmans, who diſſected the dead bodies, and all the phyſicians and ſurgeons of the hanoverians, the

* *Vrye gedachten en Aanmerkungen over het niet Beſmettelyke van den Roodeloop, Algem. Vaderl. Letteroeffeningen*, 1783, Mengelw. blad. 577—584.

† *Rat. Med.* part 3, ſect. iv, cap. viii, p. 222 et 223.

nurſes,

nurſes, and other attendants of the ſick. Thus a camp-dyſentery, which is commonly believed to be very infectious, was here evidently free from contagion: therefore I cannot but agree with Stoll, who obſerves, that indeed different and malignant diſorders may ariſe from the air corrupted by the ſtools of thoſe who labour under the dyſentery; but that the ſame diſorder is by no means communicated to others, as in the ſmall pox, and other contagions *.

It appears therefore, that when the attendants and nurſes of the ſick are ſometimes attacked by the dyſentery, of which inſtances are recorded, both by van Swieten and Pringle, this is by no means to be explained from the infection being propagated from the ſick to the ſound, but from the prevailing condition of the atmoſphere, by which the attendants and nurſes of the ſick are as capable, and perhaps more liable on account of their ſituation, to be affected as other perſons. For it is clearly proved, that a ſimple, or genuine dyſentery is wholly exempt from all contagion, and that, though the complicated dyſentery, as an occaſional, or exciting cauſe, may communicate different diſeaſes both to the attendants, and others, nevertheleſs, it is by no means infectious: for according as the prediſpoſition differs in various bodies, there ariſe different effects from this exciting cauſe, ſo that one is ſeized with a catarrh, another with a ſore throat, a third with a cough, a fourth with a bilious fever, a fifth with a putrid one, and, in fine, a ſixth with the dyſentery

* L. 1, p. 223.

itſelf; while a ſeventh, in the body of whom the prediſpoſition to theſe morbid conditions is wanting, though attending the dyſenteric patients, enjoys uninterrupted health; whereas all contagions whatever, though differently modified, according to the different conſtitution of the perſons, always produce the ſame diſeaſe in every one.

As to the ſeventh. The means of preventing the dyſentery conſiſt in obſerving the three following precepts.

5, Let a perſon remain at home both morning and evening, for thus the morbid ſtimulus, then the moſt powerful, will be prevented from acting on his body; the ſuppreſſion of the perſpiration ſhould be avoided with the greateſt precaution; and the perſpiration muſt be reſtored by diaphoretics, if unfortunately ſuppreſſed.

2, Let him be abſtemious in his diet, that is, let him be cautious of eating or drinking too much: for the reſt, it is not neceſſary, that he ſhould live only upon vegetables; on the contrary, a moderate uſe of animal food is adviſeable.

3, As the way, by which the noxious ſtimulus enters our body in the dyſentery, is principally the alimentary canal, and as any organ is the more eaſily affected, the more it is weak and irritable, the *primæ viæ* are to be ſtrengthened, in order that they may be capable of repelling the morbid ſtimulus, and whatever diſturbs their functions ſhould be avoided with the greateſt care. For this purpoſe

the

the bark in conjunction with ſome bitters and a little rhubarb, proves uſeful. Being digeſted two days with french white wine, port wine or geneva, which may anſwer the purpoſe as well as wine, except for perſons of weak and delicate conſtitutions, the tincture may be taken daily as far as a few glaſſes; I do not add the rhubarb with the intention of purging, but of ſtrengthening, and as it at the ſame time prevents the bowels from becoming filled up with ſordes. I have frequently made uſe of the following formula for a bottle of wine.

℞ Rad. Gent. ℥ſs.
Cort. Peruv. ℥i.
Rad. Rhe. ʒi.
Flor. Lavend. m. i.
F. collectio.

If theſe rules be accurately obſerved, if beſides a phyſician be conſulted on ſome precautions, which ſometimes are requiſite, either on account of the epidemic, or the peculiar diſpoſition of the body, of which I cannot here take notice, the dyſentery will be almoſt always avoided. This is not a mere theoretical ſpeculation, but is founded on practical facts; for three years ago, during an epidemic dyſentery, I preſcribed the above medicines to many perſons, with ſuch ſucceſs, that not one of them was ſeized with the reigning diſeaſe; and though among this number there were many perſons, whoſe daily occupations did not permit them to ſtay at home either morning or evening, yet by making uſe of the above medicines, and wearing flannel ſhirts next to the ſkin, they all remained free from the diſtemper.

As to the eighth. The manners of dying by the dyſentery may be reduced to the four following; viz. a fainting, a colliquative flux, an inflammation of the inteſtines, and a chronical dyſentery. I have already ſpoken of the manner in which the firſt three kill; and as to the chronical dyſentery, it, for the moſt part, agrees with the colliquative flux, as in both caſes the vital powers being continually more and more exhauſted, the patient ſlowly dies. Still it differs from the latter, in as much as pain is always felt at the time of going to ſtool by thoſe who labour under the chronic dyſentery, and there exiſts a chronic inflammation, together with a thickneſs and induration of the coats of the inteſtines.

GENUS III.

Cholera.

The cholera morbus is a conſtant and violent diſcharge of the contents of the *primæ viæ* by vomiting and purging. The diſeaſe is preceded by nidorous eructations, heart burn, pain of the ſtomach and inteſtines: afterwards exceſſive vomiting and purging come on, attended with acute pains and gripings of the inteſtines, eſpecially in the umbilical region; tenſion of the abdomen; retention of urine; quick, weak, irregular pulſe; ſpaſm of the abdominal muſcles; palpitation of the heart; proſtration of ſtrength; cold ſweats; hiccup; great thirſt; anxiety; and univerſal convulſions.

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The remote cauſes of the diſorder are various. The chief is an increaſed ſecretion of bile of an acrid kind, occaſioned by the warmth of the atmoſphere; for the complaint prevails only in the warm ſeaſons, and the matter rejected, both upwards and downwards, conſiſts chiefly of acrid bile; another main cauſe, which not unfrequently acts in conjunction with the former, is the perſpiration being ſuppreſſed from an expoſure to cold rainy evenings, after extremely hot and dry days: and hence the diſeaſe uſually occurs at the end of auguſt, and in the autumnal months. The leſs frequent are food of difficult digeſtion, fruits uſed in exceſs, and violent paſſions of mind.

The proximate cauſe conſiſts in violent ſpaſmodic conſtrictions through the whole extent of the alimentary canal, by which an acceleration and inverſion of the periſtaltic motion of the ſtomach and bowels are produced. Theſe convulſive motions are commonly communicated to the abdominal muſcles and frequently to thoſe of the thighs and legs.

The prognoſis is favourable, when the diſeaſe attacks young perſons, when a gradual diminution of all the ſymptoms appears, and this is ſucceeded by quiet ſleep, and a gentle moiſture on the ſkin. On the contrary, ſyncope, coldneſs and ſpaſm of the extremities, extreme debility, fetid vomiting, cold ſweats, hiccup, and an intermitting pulſe, are dangerous ſigns. In old people, the diſeaſe is always very formidable, as, on account of the ſhock communicated to the conſtitution by it, the ſtrength is

often ſuddenly weakened, and the patient's life is ſometimes deſtroyed in the courſe of a ſingle day. The diſeaſe, however, for the moſt part, puts on a leſs alarming appearance, and life may generally be ſaved, by having recourſe to a proper treatment in the beginning of the diſeaſe.

The cure depends upon promoting the evacuation of the redundant acrid bile, by the plentiful exhibition of diluents, and allaying the too great irritability of the *primæ viæ* by opiates. Chicken broth, warm water and milk, thin rice gruel, the almond emulſion, the decoctum album of Sydenham, and the emulſion of gum arabic, anſwer the firſt indication. Emollient glyſters frequently thrown up prove likewiſe very uſeful. If the vomiting ſhould continue, an infuſion of chamomile flowers, mint tea, or the ſaline draught, ſhould be given, and anodyne and warm plaſters, and even bliſters are to be applied to the region of the ſtomach. Though the purging ſhould not be ſuddenly or totally ſtopped, yet, in dangerous caſes, where the ſtrength of the patient is very much weakened, and the ſpaſmodic contractions become very violent, and are communicated to other parts of the body, the irritation ſhould be immediately obviated by a free uſe of opiates, given in a ſmall bulk, either by the mouth or by glyſter. The warm bath, ſpirituous fomentations, and even bliſters applied to the abdomen, are frequently found to alleviate the ſevere pain and ſpaſmodic contractions of the bowels. In caſes where the pulſe is ſmall, or full and hard, and the patient plethoric, veneſection is to be performed. When the diſeaſe is ſubdued, it

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is neceſſary to ſtrengthen the *primæ viæ* by the exhibition of bark and chalybeates, joined with aromatics and opiates: thus the prediſpoſition to relapſe, to which the patients are otherwiſe extremely liable, will be effectually removed.

If the cholera prove fatal, either the patient's life is deſtroyed amidſt univerſal convulſions, or a mortal ſyncope enſues in conſequence of the ſhock the ſyſtem undergoes from the conſtant and violent vomiting and purging.

GENUS IV.

Of the Vomitus Cruentus, Morbus Niger, Hepatirrhœa and Hemorrhoids.

All theſe morbid affections I conſider as one diſeaſe, differing only with reſpect to the ſeat of the complaint and the violence of the ſymptoms; ſince it appears from the obſervations of practitioners, that theſe diſorders often ſucceed each other in an uninterrupted ſeries *. I have myſelf cured a patient, in whom the vomitus cruentus, the morbus niger, and the hepatirrhœa, ſucceſſively followed each other, and who before had frequently laboured under the hemorrhoids.

* Richter, l. l. kapitel ix, p. 144.

The nature of this diſeaſe is involved in much obſcurity, yet on conſidering the attendant ſymptoms, and comparing them with what is obſerved on diſſection of ſuch bodies, the diſorder ſeems to originate from a diſtention of the veins beyond their tone. This is proved, not only by the hemorrhoids, which, conſidering their different ſeat, perfectly agree with the morbus niger; but alſo from the obſervations of Kampf, Tiſſot, and Stoll, who have always found the veins of the affected organ enlarged by varices in ſuch bodies *. Thus either the dilatation or rupture of the veſſels, in ſome part of the body, ſeems to conſtitute the proximate cauſe of theſe four diſorders; which have received different names, becauſe different effects are obſerved, according to the organ attacked. Thus, if the complaint have it's ſeat in the *rectum*, hemorrhoids ariſe; whereas, if the veſſels of the ſtomach, or of the upper part of the bowels, or the vaſa brevia of the ſpleen ſuffer, the vomitus cruentus is the conſequence: and if the diſorder originate from the veſſels of the liver, ſpleen, or bowels, the morbus niger is produced; yet ſo that the blood from the rupture of the veſſels both of the liver and ſpleen is commonly of a deeper black hue, than that, which flows out of the veſſels of the inteſtines: laſtly, if either a diapedeſis of the veſſels take place inſtead of their rupture, or the ruptured veſſels, beginning again to contract themſelves, prevent any

* I. Kampf *Abhandlung von einer neuen Methode die Hypochondrie zu heilen, dritten auflage, Wien* 1788, cap. viii, p. 383 and 450; Tiſſot Epiſt. ad Zimmermannum *de Morbo nigro, Scirrhis Viſcerum* &c. obſ. 1, p. 9, and obſ. 2, p. 17, & Stoll *Rat. Med.* pt. 1, ſect. xiv, p. 154, and pt. 3, ſect. v, p. 253.

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thing flowing out except bloody ſerum, reſembling the water in which fleſh-meat has been waſhed, there ariſes a flux of the liver; and hence may readily be explained, why the morbus niger ſo often terminates in this flux.

The remote cauſes of this diſeaſe are a lazy, ſedentary life, food of difficult digeſtion, want of bodily exerciſe, indulgence in the luxuries of the table, ſedative paſſions of the mind, &c. As theſe cauſes often exiſt without occaſioning the morbid condition of which we are now ſpeaking, it follows, that a certain prediſpoſition of the ſyſtem is neceſſary, in order that the exciting cauſes ſhould bring about the ſpecific alteration of the ſanguiferous ſyſtem: and this conſiſts in a certain organic diſpoſition of the conſtitution; for theſe cauſes do not produce the diſeaſe, except in perſons either of a cholerico-melancholic, or of a phlegmatico-melancholic temperament; in both which, there is naturally a degree of torpor of the vital principle, and a general rigidity of the whole habit, in the performing of the functions both of body and mind. Perſons of this caſt are of a ſerious thoughtful diſpoſition, and leſs moveable than others by any impreſſions, but are remarkably tenacious of whatever ſentiments happen to affect them. This melancholy diſpoſition is not attended with any morbid affection either of body or mind; but when the exciting cauſes of a ſedentary life, want of exerciſe, ſedative paſſions of mind, and full manner of living, concur with this diſpoſition, then it becomes a diſeaſe affecting both, but the mind principally. For the digeſtive powers being incapable of converting the

large quantity of food taken into proper chyle, the natural conſequence is, that a vitiated lymph is tranſmitted to the ſanguiferous ſyſtem, but the blood veſſels, naturally ſlow in their action in ſuch ſubjects, are not diſpoſed to act on the lymph with due force, or to clear the blood from it's ſordes by the urine and inſenſible perſpiration: thus the equilibrium between the blood veſſels and their contents is deſtroyed, and an over-diſtention of the veſſels takes place, on account of the excrementitious fluids being retained in the circulation; and as the balance of the ſanguiferous ſyſtem is manifeſtly upon the ſide of the veins, theſe become diſtended beyond their tone. As the action of the veſſels is always in the compound ratio of the ſtimulus applied, and the faculty of reaction depending upon the organic ſtructure of the part affected, it is evident, that the veſſels, being ſpecifically ſtimulated by the vitiated blood, ſpecifically react on the maſs of blood, and of courſe the blood muſt become daily more and more altered from it's healthy craſis, and the complaint gradually grows worſe and worſe. The diſeaſe generated by this morbid ſtate of the ſanguiferous ſyſtem, however, is not the morbus niger, but melancholia, differing in it's degree in the cholerico-melancholic and in thoſe of a phlegmatico-melancholic temperament; ſo that it is to be cured in the former ſubjects by the leſs ſtimulating or cooling aperients; and in the latter, by having recourſe to thoſe of a hot ſtimulating kind: though all theſe remedies generally prove ineffectual, without a proper control over the patient's mind.

But as all the veſſels of the ſanguiferous ſyſtem do not propel the blood with equal force, and the veins of the abdomen are thoſe which poſſeſs the leaſt energy, the circulation of the blood being ſlowly performed in them even in vigorous health, this firſt ſtage of melancholia, when not remedied either by nature, or by art, ſoon changes into the ſecond: for the black and denſe blood of the melancholic, flowing towards the abdominal veins, is conveyed much more ſlowly than uſual through theſe veſſels. If thus the quantity of blood be in no way diminiſhed, and at the ſame time the circulation be rendered much ſlower, the conſequence muſt be, that, the equilibrium between the veſſels and the blood being diſturbed in theſe parts, ſome veins are conſiderably diſtended; and theſe would become entirely deſtitute of tone in a few days, were it not, that the blood, from a law common to all the fluids, ever flowing toward ſuch parts as oppoſe the leaſt reſiſtance to it, is now carried, for the greater part, to the collateral branches; theſe, however, ſoon ſink under the unuſual weight, and ſuffer alſo a preternatural diſtention: hence may be explained, why in ſuch bodies the whole ſurface of any abdominal viſcus preſents, as it were, a net of diſtended and varicous veins. Such a varicous dilatation of the veſſels takes place in different viſcera of the abdomen, in proportion as one is more weak than the others, and according to the various employments of the patients: and hence it may be readily explained, why in one melancholic patient the anxiety takes place at the region of the ſtomach, in another in the right ſide of the abdomen, in a third in the lower part of the belly,

and in a fourth through the whole abdomen: though a ſenſe of weight, pain, and fullneſs, together with the other ſymptoms of the diſeaſe, is moſtly obſerved in the lateral parts of the abdomen, eſpecially in the right ſide, becauſe the circulation of the blood in the moſt healthy perſons is very ſlowly performed in the ſyſtem of the vena portarum.

In this ſtage of the diſeaſe, or ſometimes before it, the vital powers, on account of the many diſorders in the animal economy, often exert unuſual efforts, to expel the noxious matter from the body, and to reſtore the equilibrium between the veſſels and the blood. A fever then ariſes, by means of which, if not too violent, nature not unfrequently accompliſhes her purpoſe, and the morbid matter is diſcharged from the body by a happy criſis; as Kampf and Grant have demonſtrated, that intermitting fevers, and the ſimple ſynochus, often originate from this morbid condition of the abdominal viſcera*.

Theſe fevers, however, are, ſtrictly ſpeaking, not idiopathic, but ſymptomatic. Their treatment has been conſidered, when we were on the ſubject of ague. But if theſe efforts be either wanting, inſufficient, or imprudently ſuppreſſed, the complaint increaſes, and, at length, the various veins undergo a chronic inflammation, which ſeems to be another and more violent effort of nature to get rid of the

* Kampf l. 1. kapitel i, p. 15; and Grant, vol. i, of the ſynochus non putrid. p. 151.

morbid

morbid ſtimulus. Therefore pain of the affected organ in a greater or leſs degree invariably precedes the morbus niger, and the other morbid affections belonging to it *. This chronic inflammation of the veſſels may be protracted for a long time, and, if not remedied, either by art or nature, in it's commencement, it terminates in three ways, viz. either the turgid veſſels ſuffer diapedeſis, and there flows out a bloody ſerum, in which caſe the hepatirrhœa is produced: or, which more frequently happens, a rupture of the veſſels takes place; and in this caſe, according to the part affected, either a vomitus cruentus, the morbus niger, or the hemorrhoidal flux, enſues; the laſt of which often effects a happy criſis: or, in fine, this chronic inflammation changes into induration, when the total deſtruction of the organical compoſition of the affected viſcus follows, and hence the ſcirrhoſities of the viſcera, for the moſt part, take their origin †.

Although the circulation is very ſlowly performed through the veins dilated by varices, yet a real obſtruction of the veſſel by the ſtagnant blood, though generally taken for granted, never, I believe, exiſts in the living ſubject; on the contrary the blood is conveyed through theſe varicous veſſels in an interrupted courſe, as long as their organic compoſition is not wholly deſtroyed. Indeed it may be eaſily proved by repeated obſervations of

* Richter l. l. kapitel ix, p. 145, and Tiſſot l. l. p. 5, & obſ. ii, p. 13.

† Tiſſot l. l. obſ. iii, p. 26 & 27.

nature,

nature, by the ſtructure and function of the affected parts, and, in fine, by ſound reaſoning, that neither obſtructions, nor infarctus of the veſſels by ſtagnant blood, ever exiſt; and that the medicines called reſolvents by no means operate by reſolving an accumulated thick matter. If only the varicous dilatations of the internal veins be compared with the external varices, what ſtrength does my opinion thence acquire!

1, It is well known, that ſome ladies are afflicted with varices of the lower extremities in the firſt months of pregnancy, that they uſually labour under them till their delivery, after which the diſorder often ceaſes ſpontaneouſly; which manifeſtly ſhows, that there is always a communication between the blood contained in theſe veins and the other blood-veſſels, and that their varicous ſtate is by no means to be imputed to the accumulation of the ſtagnant blood, but only to it's reflux being prevented by the preſſure of the uterus upon the trunks of the veins; of courſe no obſtruction of the veſſels exiſts.

2, The moſt turgid varices are often cured merely by applying a moderately tight bandage, if the veins have not entirely loſt their tone: an evident ſign, that no obſtruction of the veſſels by ſtagnant blood takes place.

3, Very copious hemorrhages often ariſe from inveterate varices, ſo that even danger of death ſometimes attends them*: another ſign, that the

* Richter *Anfangsgrunde der Wundarzneykunſt, erſter band*, kapitel xx, p. 408.

veins,

veins, though varicous in the higheſt degree, always keep up a communication with the reſt of the ſanguiferous ſyſtem.

As it is thus proved by the varices of the external parts, that there exiſt no obſtructions, ſo my opinion is farther ſupported by the ſtructure and function of the affected organs. For inſtance, let us ſuppoſe, that the liver, a viſcus liable the moſt of all to infarctions according to the common opinion, labours under an obſtruction of the ſyſtem of the vena portarum; the conſequence muſt be, that the blood, which is carried to it from all the veins of the abdomen, and ſhould ſerve for the ſecretion of the bile, cannot paſs through, but flows back towards the abdominal viſcera. What great diſorders muſt not hence ariſe in the circulation, and in the whole animal economy? for when the bile is wanting, digeſtion cannot be performed, the chyle is not properly prepared, in a word all the functions muſt neceſſarily languiſh for want of the requiſite ſtimuli. Beſides, the obſtructed liver will occupy a much larger ſpace than uſual, on account of the ſtagnant blood, of courſe the ſtomach, and the other parts, removed from their natural ſeat, muſt ſuffer the greateſt compreſſion. How great a degree of tenſion and pain muſt neceſſarily follow from all theſe changes is manifeſt, from the ſituation and connexion of theſe parts; and is farther proved by the ſymptoms attending a ſtoppage of the circulation through the liver, in conſequence of the total degeneration of this organ, a remarkable inſtance of which is recorded by Tiſſot. The patient ſuffered ſo many and ſuch ſevere complaints,

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that this phyſician, otherwiſe very averſe to the uſe of opium, in this caſe gave it in a large doſe, with the intention only of mitigating the intolerable pains*. As in thoſe caſes, wherein according to the common opinion obſtructions exiſt, theſe ſymptoms are always wanting, this is a freſh proof, that no obſtructions exiſt in the living body.

Let it not be argued, that all the veſſels of the vena portarum do not become obſtructed, but only ſome of them: for, beſide that the ſtagnant blood would continually ſtimulate theſe veſſels, and that this ſtimulus muſt naturally effect a ſtrong contraction of them, by which the obſtruction would be immediately removed, the internal coat of the ſanguiferous veſſels is provided with a great number of lymphatics, which, incited to act by the ſtagnant blood, would directly render the paſſage free by the abſorption of the ſuperfluous quantity. Finally, in dead bodies obſtructions can never be diſcovered, and nobody has hitherto proved their exiſtence, even by a ſingle ſpecimen from diſſection.

I have had an opportunity of obſerving the ſtate of the viſcera after death in a great number of bodies, but in none of them have I ever met with either an obſtructed blood veſſel or gland. In the caſes, wherein the meſenteric glands are ſwelled and indurated, my worthy preceptor profeſſor Brugmans commonly injected mercury through them with the ſame facility, as through ſound glands: the morbid matter was not depoſited in

* Tiſſot l. l. obſ. iii, p. 24.

their

their cavity, but between their cellular texture. Indeed I dare venture to affirm, that both the veſſels and the glands always remain pervious, as long as their organical compoſition is not wholly changed; of which indeed I have ſometimes ſeen inſtances, though I never found a total degeneration either of all the glands of the meſentery, or of the whole liver, and I believe, that theſe caſes very ſeldom take place.

What now is to be ſaid of reſolvents, as they are commonly called? Calomel is one of the moſt powerful; yet is it to be believed, that a few grains of this medicine, having already undergone various changes both in the *primæ viæ* and in the lymphatic ſyſtem, are nevertheleſs ſtill able to reſolve ſtagnant accumulated blood, or the obſtruction of any veſſel in the ſanguiferous ſyſtem? Who will maintain, that three or four grains of emetic tartar, given in divided doſes, act by reſolving a thick accumulated matter? Do not, on the contrary, theſe inſtances ſhow, that the reſolvents operate not immediately on the fluids, but act upon the ſolids, and impreſs on them a certain and determined motion, by which the blood is cleared of the morbid matter, which is carried by the *vis naturæ medicatrix* to different emunctories, and expelled the body? This is farther confirmed by the manner of operating of the hot reſolvents, as they are commonly called, which, beyond all doubt, act on the ſolids, as, on account of their violent ſtimulus, they are only to be given to patients of a cold indolent temperament, or an advanced age. But to reſume my ſubject.

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The black diſeaſe ariſes then from a rupture of the veſſels, moſtly brought on by a previous chronic inflammation, which nevertheleſs is not requiſite to this diſeaſe, becauſe the rupture of the veins dilated by varices may ariſe from too great extenſion alone, without any previous inflammation.

The morbus niger is preceded by a ſenſe of fulneſs and pain at the place where the rupture of the veſſels is to happen, which is a certain ſign of the approaching diſeaſe. The patients are likewiſe afflicted with nidorous eructations. This diſeaſe never takes place before the conſtitution has undergone a ſpecific alteration; which is clearly marked in the features of the face, for theſe patients have a peculiar dark ſallow countenance, ſo that the practitioner, by a mere look at the face, may find out the diſorder they labour under. This atrabilious conſtitution, as it is uſually called, never exiſts in the healthy ſtate, but is always the effect of the inveterate melancholia, and cauſed by the long continuance of the diſorder: hence the diſeaſe in queſtion never attacks youth, but moſtly people of a ſomewhat advanced age, who have laboured under melancholia for a conſiderable length of time. The paroxyſm begins with a vomiting of black blood, or with copious bloody ſtools of a black hue; the quantity of blood diſcharged is often ſurpriſing; the patients are deadly pale; violent gripings of the bowels, with tenſion of the abdomen, cold ſweats, fainting, and an intermittent pulſe, are not uncommon ſymptoms; and ſometimes the patients expire under the evacuation.

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As the diſeaſe is of ſuch an alarming nature, the phyſician ſhould immediately attempt to alleviate the violent gripings of the inteſtines, the acute pains at the umbilical region, and the tenſion of the abdomen, by the uſe of tamarind whey, the decoctum graminis, and taraxaci, extractum graminis, and tartarus ſolubilis, and in caſes of urgent danger, by ſmall doſes of opium and ipecacuanha, demulcents, emollients, glyſters, and by applying ſheets dipped in cold water to the abdomen. As ſoon as by theſe means the paroxyſm has been removed, and the ſtools take on their uſual appearance, the bark, Iceland liverwort, aſafœtida, and dulcamara, in conjunction with a moderate uſe of wine ſhould be employed, in order to ſtrengthen the habit; for otherwiſe the diſeaſe generally returns after ſome days.

But though by the tonic plan the patient's ſtrength may be reſtored, ſo as to allow him to return to his uſual occupations, yet the prediſpoſition to the complaint is not removed by theſe tonics: there is always a tendency to relapſe, as ſoon as the patient is expoſed to an exciting cauſe; and the diſeaſe uſually ſooner or later makes it's appearance again. This happens repeatedly, the intervals between the paroxyſms become ſhorter, the ſtrength is gradually exhauſted, and at laſt the patient ſinks under the diſeaſe. The removal of the atrabilious conſtitution, when it has once taken place, is a matter of much difficulty; and the change of the conſtitution to the healthy ſtate, or the radical cure, is not to be expected but from a long continued uſe of aperients joined with tonics, a ſimple diet of eaſy digeſtion, and regular manner of living.

The

The hepatirrhœa, differing only in degree from the morbus niger, requires the same treatment.

With respect to the hemorrhoids, if they be critical, nothing should be done, but to prevent costiveness, and to mitigate the pain by fomentations. When they are symptomatic, topical bleeding by leeches, or by the lancet; the use of cooling purgatives; and the application of the unguentum nutritum with rubigo martis, to the affected part; will generally afford relief. If these should prove unsuccessful, the piles are to be removed either by ligature, or by excision; but all this is to be understood of the hemorrhoids when a local disorder of the rectum, as is very frequently the case; for when they are a constitutional complaint, recourse should be had to the same treatment as recommended in the morbus niger.

If the patient be destroyed by the morbus niger, it is in consequence of the copious and profuse discharge of blood by vomiting and purging; the blood infused into the alimentary canal operates as an extraneous body bringing on an acceleration and inversion of the peristaltic motion of the stomach and bowels; hence the remedies taken in are often immediately thrown up again, or discharged by stools; one fainting fit succeeds to another, from the loss of so great a quantity of blood; and these symptoms continue, till the patient falls at last into a mortal syncope, by which the scene is closed.

ORDER

ORDER II.

Hemorrhages.

Hemorrhages, in whatever part of the body they appear, bear a great analogy to each other in their cauſes, ſymptoms, prognoſis, treatment, and manner of deſtroying life; of courſe there is no need of treating particularly of each. A general view of them is quite ſufficient; except the hemoptoe, which, on account of the importance of the afflicted organ, it's peculiar ſymptoms, and the manner of treatment it requires, deſerves ſeparately to be conſidered. Therefore in this order I ſhall treat firſt of hemorrhages in general, and ſecondly of hemoptyſis in particular.

As to the firſt. A hemorrhage is a copious and quick effuſion of blood, either ſpontaneous, or excited by violence.

Whatever dilates the orifices of the veſſels, or produces a rupture of them, may occaſion a hemorrhage. The ſpontaneous hemorrhage chiefly owes it's origin to the diſturbed action of the ſanguiferous ſyſtem, by which the blood is not equally conveyed through the whole body, but is driven to ſome organs in a greater quantity, and quicker courſe: for the veſſels of theſe organs, thus quickly diſtended beyond their tone, by the great quantity of blood conveyed to them, ſuffer either a dilatation, or a rupture; eſpecially if the veſſels want ſufficient

force to resist, either from the weak condition of the patient, or the peculiar debility of the affected organ.

Though this cause alone may sometimes produce a hemorrhage, still, for the most part, another cause is added to this unequal distribution of the blood, which is the reaction of the *vis vitæ:* for, as soon as the vessels are more than usually distended by the too great quantity of blood conveyed to them from an innate faculty in every part of the animal body to avert all inconveniences, they directly collect all their powers to drive forward the redundant blood, and by their violent contraction greatly contribute to bring about a dilatation or rupture in the vessels. Cullen has ingeniously explained the reason, why hemorrhages, returning at several intervals, always attack the same organs, from this, that though the superabundant blood is taken away in the affected organ by the hemorrhage, the causes yet remain, by which the accumulation of blood to this organ is produced, which causes now more easily than before bring on a congestion, because the vessels of the organ, before attacked by the hemorrhage, make less resistance to the torrent of blood, on account of their relaxed tone *.

A peculiar degeneration of the sanguiferous system is sometimes among the causes of hemorrhage: for the vessels, in the highest degree of the scurvy, the lues venerea, and other diseases, fre-

* *First Lines of the Practice of Physic*, vol. ii, book iv, chap. i, sect. ii, p. 265.

quently

quently undergo such an alteration that the blood flows out, as it were, through a sieve, along their whole extent. In such cases the hemorrhage is to be imputed neither to the unequal distribution of the blood, nor to the too great reaction of the vessels; but, on the contrary, to the great languor of the vessels, through which, being stimulated by the preternaturally altered blood, they instantaneously suffer diapedesis, or even rupture.

In fine, a hemorrhage often arises from some external mechanical cause in a person enjoying good health, though, strictly speaking, in both the last cases, the hemorrhage is not the disease itself, but only a dangerous symptom of the disease.

The prognosis of hemorrhages differs, according to the constitution of the body, the quantity and quality of the blood lost, and the greater or less diameter of the vessels affected. Thus, for instance, a hemorrhage arising from the degeneracy of the vessels is generally ominous, on account of the torpor of the vital principle, which always accompanies it. For the same reason the effusion of the blood depending upon atony is much to be feared; because, if the atony be not quickly remedied, the hemorrhage cannot be stopped, and life is destroyed: as is proved by a great number of lying-in women, who die of a flooding, arising from the atony of the womb after delivery. That, which owes it's origin to plethora, is, in general, more easily cured, and often spontaneously ceases; yet it may prove mortal, at least Hildanus relates, that a vigorous young man, liable to a bleeding at the nose during many

years, at length ſuffered ſo great a hemorrhage from the noſe, that he quickly died *. If, in fine, the hemorrhage be owing to an external injury, for inſtance, to a wound, the prognoſis ought to be taken from the diameter of the wounded veſſels; ſince, if the wounded artery be a principal trunk, and the more if it be in the vicinity of the heart, death, for the moſt part, quickly enſues from it's injury, on account of the quantity of the blood loſt, though van Swieten relates an inſtance of a farmer, in whom the axillary artery was cut with a knife, and who ſtill happily recovered *.

Hemorrhages are to be treated differently according to their cauſes. In the plethoric, veneſection, the antiphlogiſtic treatment, and a low ſpare diet, accompliſh the cure. If the hemorrhage either ariſe from a ſpaſm, or continue from this cauſe, opium, ſmall doſes of ipecacuanha, other antiſpaſmodics, and bliſters, are to be recommended. When the hemorrhage is produced by the degeneracy of the veſſels, it is only a ſymptom of another diſeaſe, which is to be cured in a different way, according to the diſeaſe with which it is combined. If the hemorrhage be owing to ſome external injury, and thus there exiſts a wound at the ſame time, the veſſels ſhould be ſecured by ligature, ſtyptics, or compreſſion, and thus a ſtop put to the hemorrhage. Laſtly, if the hemorrhage, ariſing from any internal cauſe, become dangerous by it's duration, and the

* G. F. Hildanus *Opera omnia Obſ. Chirurg. cent.* vi, obſ. lxxii, p. 606. *Frankfurti ad Mœnum.* 1646, folio.

† L. l. t. i, § 161, p. 235.

quantity

quantity of the blood loſt, and thus the vital indication be urgent, aſtringents muſt be employed: the preparations of iron, eſpecially the murias ferri, and alum, ſurpaſs the others: Cullen is of opinion, that the laſt of theſe proves the moſt powerful *: and my worthy preceptor, the celebrated Ooſterdyk, profeſſor of the practice of phyſic at Leyden, informed me, that he had ſtopped a hemorrhage of the womb by exhibiting alum, after having in vain tried the preparations of ſteel. The external application of aſtringents is ſometimes uſefully added to their internal uſe: cold water ſtands foremoſt among them: the tying of the extremities is an uncertain, and ambiguous remedy: Bennet already † obſerved, that the extremities are not unfrequently tied in vain; and, on the contrary, he almoſt always found it uſeful to ſolicit the blood towards the extremities by gentle friction, and perhaps friction may prove advantageous to the patients in ſome caſes. If, in fine, the hemorrhage cannot be ſtopped, the veſſels at laſt collapſe for want of blood; the patient becomes extremely weak; the face, lips, nails, and, in ſhort, the whole body grow pale; the pulſe becomes fluttering and intermittent; the extremities are cold; ſleepineſs ſteals on; fainting enſues: the vital powers exert, for the laſt time, vain efforts to reſtore the diſturbed equilibrium, ſlight convulſions of the limbs come on, and thus life is uſually extinguiſhed amid the very reaction of the ſyſtem.

As to the ſecond. The hemoptoe is a throwing up of blood from the lungs by the mouth. The

* L. 1, § 1298.

† Bennet *Theatrum Tabidorum*, cap. xxv, p. 67.

diſorder is uſually preceded by dyſpnœa, a ſenſe of uneaſineſs or pain, and ſometimes of heat in the breaſt, titillation of the fauces, a ſaltiſh taſte in the mouth, a fluſhing of the cheeks, and a ſlight cough, which is ſucceeded by a throwing up of pure frothy florid blood. This diſeaſe is of frequent occurrence; at which, conſidering the great number of lung-veſſels, and their very delicate ſtructure, no one can be ſurpriſed. The different ſpecies of the hemoptoe, enumerated by noſologiſts, may, in my humble opinion, be properly reduced to the four following; viz. the habitual, the cacochymic, the periodical, and the accidental; which ſeveral ſpecies ſeem to me neceſſary to be diſtinguiſhed, both becauſe they are founded on the obſervations of nature, and each of them requires a ſomewhat different treatment.

1, *The habitual* is known by a bad formation of the thorax, a narrow cheſt, a long tender neck, the ſhoulder-blades extended in the manner of wings, a ſlender, delicate, and graceful appearance, a ſnow-white face, roſy cheeks, a vividneſs of the eyes, a fine genius, gayety of mind, and a delicate irritable fibre. Such perſons, about their eighteenth year, ſome ſooner, others later, according to the arrival of an accidental or exciting cauſe, fall into a hemoptyſis, eſpecially if an hereditary diſpoſition be joined with the above ſymptoms.

2, *The cacochymic* ariſes from a certain morbid condition of the ſanguiferous ſyſtem. The hemoptyſis ariſing from a ſcrofulous, ſcorbutic, and venereal, diatheſis, and that which ſometimes proceeds from

from the abuſe of mercury, belong to this ſpecies.

3, *The accidental*, depending neither upon an hereditary taint of the lungs, nor upon the morbid ſtate of the veſſels, is produced from accidental cauſes.

4, *Periodical* is when a diſcharge of blood from the lungs, returning at intervals, acts, as it were, as a ſubſtitute for the abſent or ſuppreſſed menſes, or hemorrhoids.

The prognoſis of hemoptyſis is to be derived not only from the quantity of the blood diſcharged, but alſo from it's different cauſe and ſpecies. Thus the habitual is always ominous, for this generally happens from the eighteenth to the thirty-ſixth year, often returning during this interval, after which it moſtly terminates in an incurable phthiſis. The cacochymic is, in moſt caſes, not of a better prognoſis, as being always attended with a morbid ſtate of the ſanguiferous ſyſtem; for which reaſon, though a proper mode of treatment be purſued, yet it oftens returns, and not unfrequently brings on a conſumption. On the contrary, the accidental and periodical forebode leſs danger, eſpecially when they ariſe in an otherwiſe ſound body from plethora, or from the ſuppreſſion of a wonted diſcharge, and are oftentimes eaſily cured: though it is not to be denied, but that even theſe ſpecies of the hemoptyſis always require to be treated with very great attention, both on account of the quantity of blood effuſed into the cellular texture of the lungs, and

the danger of a freſh paroxyſm to be apprehended from the weakneſs communicated to the lung-veſſels; and that they often prove deſtructive.

No general rules of cure can be preſcribed in this diſeaſe, as each ſpecies requires different treatment. Thus, in the habitual, where a diſpoſition of the blood to inflammation always exiſts, neither bark, ſteel, a milk diet, nor mineral waters agree. For what could theſe remedies effect? How could they ſtop a hemoptyſis, occaſioned by a local plethora of the lungs, ariſing from a bad conformation of the thorax, which neceſſarily muſt be increaſed by their uſe? Nay, the aſtringents and tonics are ſo far from preventing the approaching hemoptyſis by ſtrengthening the lungs; that, on the contrary, they rather produce a freſh paroxyſm, by exciting an inflammatory ſtate and orgaſm of the blood, and ſoon bring on an incurable phthiſis. Therefore theſe remedies ought to be laid aſide in ſuch caſes; while this complaint, the radical cure of which is commonly beyond the power of the healing art, may at leaſt be mitigated by ſmall but frequent bleedings, an antiphlogiſtic regimen, and an abſtemious and low diet; and by theſe means the hemoptyſis may be prevented from changing into a pulmonary conſumption. Stoll relates, that by this treatment he preſerved a patient labouring under hemoptyſis from a conſumption for many years, till another phyſician was conſulted, who aſſerting, that the lungs ſhould be ſtrengthened, ſoon precipitated the patient into an irremediable phthiſis*.

* L. l. pt. 3, p. 10 & 11.

The

The cacochymic is cured both by the common remedies of other hemorrhages, and the particular medicines againſt each ſpecific morbid condition of the ſanguiferous ſyſtem; though, in general, large and repeated bleedings are leſs uſeful in this ſpecies; and often, phlebotomy ſhould be wholly omitted; whereas the demulcents, eſpecially gum arabic, tragacanth, and the root of ſalep, joined with tonics, are often found of the utmoſt utility. The renowned Dr. Burſerius was witneſs, that a young man, who laboured under a cacochymic hemoptyſis, was perfectly reſtored, merely by a plentiful uſe of gum arabic, exhibited during a long time*.

The accidental hemoptyſis requires various medicines, according to the different noxious ſtimulus; therefore if the hemoptyſis ariſe from plethora, veneſection, emulſions with nitre, whey, and gentle purgatives; in a word, the whole of the antiphlogiſtic plan is to be purſued. If the diſorder be owing to a ſpaſmodic affection, as ſometimes happens to hyſterical and hypochondriacal patients, having premiſed or omitted a bleeding, according to the circumſtances, the cure is to be attempted by ſmall doſes of ipecacuanha, opium, bliſters, applied either between the ſcapulæ, or to the breaſt: and if a bilious matter be the cauſe, then, omitting phlebotomy, which in ſuch caſes, according to the obſervations of Stoll †, is hurtful, an emetic muſt be given, by which, and the reſt of the antibilious treatment, the hemoptyſis will be cured. When occaſioned by worms ‡, anthelmintics are to be employed. When

* L. l. t. iv, cap ii, p. 29. † L. l. pt. ii, p. 73, & ſeq.

‡ *Act. Hafn*, vol. iii, cap. xxii, p. 315.

brought

brought on by an external injury, the whole antiphlogiſtic plan ſhould be carried into execution, in conjunction with other remedies ſuited to the various circumſtances, and by no means neglecting veneſection. If the hemoptyſis be the conſequence of the tranſlation of the rheumatiſm to the lungs, the diſorder is to be removed by bleeding, opiates, diaphoretics, and the application of bliſters between the ſhoulders or to the breaſt. In a word, in this ſpecies of the hemoptyſis the cure muſt be accommodated to the nature of the irritating ſtimulus.

In the periodical hemoptyſis, if the patient be in other reſpects in a pretty healthy ſtate, no ſtrong remedies ought to be uſed; as the perſon often becomes by degrees habituated to ſuch a diſcharge, it is attended with leſs uneaſineſs, and may be protracted for many years without occaſioning phthiſis *. Accordingly the phyſician, having in vain attempted to reſtore the ſuppreſſed evacuations by gentle means, ſhould commit the whole buſineſs to nature; as the ſuppreſſed evacuations are often difficult to be reſtored, and powerful remedies in theſe caſes not unfrequently prove worſe than the complaint itſelf. But when the hemoptoe attacks girls who have not yet menſtruated, it is moſtly the forerunner of the phthiſis, as the accurate obſerver of this diſorder, Bennet, has obſerved. Dr. Meza relates however a caſe of a girl, who, having not yet menſtruated, was twice attacked with hemoptyſis; but being afterwards married to a vigorous

* Bennet, l. l. cap. iv, p. 23; Van Swieten, l. l. t. iv, § 1298, p. 21; and *Act. Hafn.* l. l. p. 308 and 309.

young

young man, her menſes occurred regularly, and ſhe enjoyed perfect health *. But if the periodical hemoptyſis be attended with dangerous ſymptoms, different medicines ſhould be tried according to the circumſtances.

Thus it appears, that it is leſs practicable to lay down certain rules for the cure of hemoptyſis, than for that of moſt other diſeaſes: how erroneous, therefore, is the opinion of thoſe, who maintain that this diſeaſe ought always, either wholly or partly, to be cured by bark, preparations of iron, and the other tonics! as it is evident, that ſuch medicines will injure by their ſtimulating power, in all caſes where either an inflammatory diſpoſition, or a plethora takes place. Though the exhibition of the bark and other tonics! after the hemoptoe has ceaſed, proves uſeful to fortify the lungs, and to guard againſt a relapſe of the complaint, in all caſes, where, to an inflammatory diſpoſition and orgaſm of the blood, a debility of the ſyſtem and weakneſs of the lung veſſels ſucceed; if, in any ſpecies whatever of the hemoptyſis, the loſs of blood be ſo great as to threaten death, the hemorrhage ſhould be directly ſtopped. Accordingly the phyſician will have recourſe to aſtringents: and theſe being tried in vain, he ſhould adminiſter cold water, which, when the indication is urgent, ought to be given every half hour as far as eight or ten ounces †. I readily allow, that the uſe of cold

* *Act. Hafn.* l. l. p. 307 and 308.

† Burſerius, l. l. t. iv, cap. ii, § 39, p. 33 and 34.

water

water is not exempt from danger, as Quarin has observed, that the patients, to whom cold water was given, for the most part, died of phthisis*. What, however, is to be inferred from this? Certainly nothing more, than that cold water must be taken with caution, when the danger of death is not very imminent; but by no means, that it is never to be administered; for desperate remedies are to be employed in desperate cases, and it is better to try a hazardous medicine, than no medicine at all; and the trial of cold water is the rather to be made, as the greatest practitioners observe, that it is often productive of happy effects†.

Sometimes it happens in hemoptoe, that, after having tried repeated bleedings, and the strict antiphlogistic plan, the spitting of blood continues, is not to be stopped by astringents, and even resists cold water. In such circumstances the physician must have recourse to opium, joined with nitre; as the continuance of the hemoptoe in these cases mostly proceeds from the too great irritability of the patient, which is diminished by the use of opium. I have more than once seen a stop put to the disease by giving opium with nitre, when the astringents and cold water had been previously tried in vain. I would therefore advise, in all cases, in which the antiphlogistic treatment is ineffectual to put a stop to the hemoptoe, to give astringents blended with opiates previous to the use of cold water. For

* L. l. cap. iv, p. 62.

† Van Swieten, l. l. t. iv, § 1200, p. 40, & seq.; Burserius, l. l. & Meza *Act. Hafn*, vol. 3, p. 314.

though

though I willingly grant, that in nearly all cases of hemoptysis, bleeding ought to precede the use of other remedies, and cannot be omitted with safety to the patient; yet I cannot help thinking, that, through deference to custom and authority, the antiphlogistic treatment is often carried too far, and we frequently bleed where we ought to administer opium and sedatives, with which astringents may be occasionally combined.

If, in fine, it be asked, what is to be thought of the riding on horseback, so recommended by Sydenham, both in hemoptysis and pulmonary consumption: I answer, that such a remedy perfectly agrees with the hypochondriacal complaints, and with the tabes mesenterica; as it is evident, that it must contribute a great deal to the cure of these diseases, by increasing the vital powers, and inciting all the functions. It may likewise prove useful even in the accidental and cacochymic hemoptysis, if the disorder were brought on by such causes, as can be remedied by increasing the motion of the blood, and by inciting the vital principle; but in all other cases, riding on horseback is not merely useless, but besides often provokes a fresh paroxysm, and accelerates the death of the patient, by inciting the orgasm of the blood.

Morgagni, Stoll, and Quarin coincide with me in opinion, and prove by many instances, that this mode of treatment frequently brings on death *.

* Morgagni, l. l. t. i, lib. ii, epist. xxii, art. 15; Stoll, *Rat. Med.* pt. i, sect. ix, p. 130 and 131; and Quarin, l. l. cap. v, p. 103 and 104.

Indeed

Indeed I have known ſeveral patients fall victims to this doctrine. When a patient dies of hemoptyſis, he is either carried off by a copious effuſion of blood from the lungs, in conſequence of which the heart, deprived of the due quantity of blood, ceaſes to act; or ſuffocated by the too great quantity of blood accumulated in the veſicles of the lungs, and in their cellular texture. Thus he dies either by a ſuffocation or a fainting; of the manner of killing of both which I have ſpoken above.

CLASS

CLASS X.

Death from Cachexies.

IN the cachexies, the habit undergoes a certain change from the healthy ſtate without any idiopathic pyrexy. It ought farther to be obſerved, that, in the diſeaſes blonging to this claſs, the animal functions appear to go on very well, and are not injured except in the progreſs of the diſorder, on account of the daily increaſing debility of the ſyſtem. The cachexies may be divided into three orders, according to their manner of operating on the body: ulcers; atrophies; inabilities and privations. But before I proceed to examine them particularly, ſomething is to be ſaid of the hectic fever, which not unfrequently accompanies diſeaſes of each order of this claſs.

The hectic fever is to be counted among the various ſubjects of phyſic, the notion of which remains hitherto vague and indeterminate; becauſe this fever, merely ſymptomatic, is attended with different ſymptoms, in various caſes, which have been looked upon as ſo many varieties of it by the writers on the ſubject. Hence different deſcriptions of this fever are met with in various authors. Moſt practitioners, continually afraid of the acrimony of the humours, maintain, that a peculiar noxious acrimony is the cauſe of this fever; and even very eminent phyſicians diſpute very warmly on the nature of this acrimony.

mony. Some attribute this diſorder to an alkaline, others to a rancid or putrid, and ſome again to an ammoniacal acrimony of the humours, and perhaps all with equal juſtice. Omitting, for brevity ſake, all animadverſion on this theory of acrimonies, I ſay only, that the fluids of the animal body ſcarcely ever ſhow the leaſt qualities of an acid or alkali, either in the hectic fever, or in any other complaint commonly aſcribed to acrimony of the humours; that this fever is never produced from acrimony itſelf; and, in fine, that the morbid condition of the blood greatly differs in this fever, according to the difference of the noxious ſtimulus. This I ſhall endeavour to demonſtrate, after enumerating the opinions of ſome modern phyſicians on the hectic.

Cullen, who treats the beſt of all on this fever, ſays, that it daily returns with paroxyſms at noon and evening; with a remiſſion, ſeldom an apyrexy, in the morning; and is generally attended with night ſweats, and urine depoſiting a furfuraceous brick-coloured ſediment. He is farther of opinion, that this fever ought always to be aſcribed to the abſorption of an ichorous matter *. Macbride aſſerts, that the hectic is a product of a peculiar acrimony; and that it differs from the other fevers in this, that the morbid matter is either ſubdued, or diſcharged from the body by the *vis vitæ* in the latter, whereas ſo ſalutiferous an event is never to be expected in the former; and as thus but little or no help in this diſeaſe is to be expected from the

* L. l, vol. ii, book iv, ſect. i, § 861, p. 369, and *Synopſis Noſelog. method.* p. 80 and 81.

natura medicatrix, the whole cure is to be looked for from the power of phyſic *.

Although thus Cullen and Macbride, with whoſe opinion the moderns, as well as the ancients, for the moſt part agree, ſuppoſe an acrimony of the fluids requiſite to the exiſtence of the hectic; yet it ſeems to me evident from the noxious powers bringing on this diſeaſe, that it often ariſes without the leaſt acrimony of the fluids, and that their altered condition, if not always, at leaſt in moſt caſes, is rather to be looked upon as an effect of the hectic fever, than as it's cauſe. For, in the firſt place, the hectic ariſes from a morbid ſtate either of the ſanguiferous or lymphatic ſyſtem: as is the caſe in a venereal, ſcorbutic, and ſcrofulous hectic. It is indeed true, that the craſis of the humours is always altered from the healthy ſtate in theſe caſes; but that the origin of the hectic is not to be derived from their diſorder, is evident from this, that the ſcrofulous, the ſcorbutic, and even the cancerous acrimony, certainly the worſt of all, often exiſt during a long time without the leaſt mark of a hectic fever. The ſame happens in ſyphilis, where, as is well known, the venereal poiſon has been already abſorbed for a long time, before this fever appears, which clearly proves, that the hectic is not occaſioned by an abſorbed morbid matter, but by the alteration of the ſolids themſelves, brought on by the noxious ſtimulus.

Secondly, it is brought on by a local diſorder of ſome organ, that is, it derives it's origin from

* L. 1. chapter xviii, p. 115 and 116.

cauſes, in which no acrimony of the fluids can poſſibly exiſt; for this fever ſometimes proceeds from different ſtimuli operating too violently on a body otherwiſe ſound; ſuch as worms and ſtones, and it is not unfrequently produced by tubercles of the lungs, the degeneration of the glands of the meſentery, ſcirrhuſes of the viſcera, &c. Now how can an ichorous humour be abſorbed in the ſcirrhus of the viſcera, in which the whole organic compoſition is often deſtroyed? In what way can an acrimony of the fluids be produced by theſe ſcirrhuſes, by worms, ſtones, &c., unleſs merely from this, that, either by the ſuppreſſion of ſome function, or by the noxious ſtimuli operating too violently, ſuch an action is impreſſed on the ſolids, as always occaſions a morbid condition of the fluids? This, which is ſufficiently demonſtrated by ſound reaſoning, is beſides confirmed by the obſervations of practitioners, not only when the hectic fever is brought on by the above cauſes, but alſo, when it is the conſequence of the phthiſis itſelf, the blood drawn out of a vein, in the commencement of the diſeaſe, is almoſt always found in it's natural ſtate, and not the leaſt diſorder of the fluids exiſts, which is only obſerved towards the end of the diſeaſe, when all the ſymptoms grow worſe: an evident ſign, that the commonly called acrimonies are nothing but the effects of the depraved manner of acting of the ſolids. Hence when the hectic ariſes from worms or ſtones, if the noxious ſtimulus be happily removed at the commencement, the former health is directly reſtored, and no diſorder of the fluids appears. What elſe can now be concluded from all this, than that the hectic is engendered by ſome morbid ſtimu-

lus operating in a certain and determined manner on the ſolids, and that no acrimony of the fluids is requiſite to it's exiſtence? As every noxious power, when violently and continually ſtimulating the ſyſtem, muſt neceſſarily bring on a debility, and a certain degeneracy of the ſolids, with which a feveriſh motion, called a hectic fever, is ſoon joined. Thus the hectic fever differs from the other fevers only in it's degree, and the reaſon why it is not determined by a happy criſis like the others, is only this, that the morbid cauſe in general cannot be vanquiſhed by the ſolids, on account of the alteration they have undergone in their ſtructure, therefore all other fevers change into hectic, as ſoon as the requiſite degeneracy of the ſolids takes place. For the reſt, the hectic fever, like all others, is nothing but a ſalutiferous ſtruggle of the vital principle; which however is prevented from having the deſired effect, either by the degeneracy of ſome organ, or by the weakneſs of the ſyſtem: for the ſolids, continually excited by the morbid ſtimulus, run into irregular and inordinate motions, by which they in vain endeavour to remedy the cauſe of the diſorder, becauſe it is either abſolutely not to be removed, or it's expulſion is ſo difficult, that the enfeebled *vis vitæ* is inadequate to it's accompliſhment; on the contrary, the organs become daily more and more weakened, and all the ſymptoms grow worſe by the very reaction of the vital powers.

Let it not be argued, that this fever cannot be conſidered as a ſalutiferous effort of nature, ſince it's ſymptoms manifeſt themſelves the more, the

nearer the patient approaches to death; as the ſame is not ſeldom obſerved in many other diſeaſes. For inſtance, analogous ſymptoms often ariſe in a ſlow nervous fever, in which, eſpecially at the end, the utmoſt torpor of the vital principle takes place; and when the patients expire in this fever amid convulſions, as ſometimes happens, are theſe irregular motions to be imputed to the exceſs of the vital powers? Are the moſt horrible convulſions, with which the wretched patients, who labour under hydrophobia, are continually agitated, to be aſcribed to the vigour of their vital principle? Is it not, on the contrary, evident, that all this is to be explained from the immoderate and irregular reaction of the ſolids conſequent to the morbid ſtimulus? The above objection therefore is of no weight, for it is founded on the falſe hypotheſis, that irregular and immoderate motions always originate from the exceſs of the vital principle; whereas the above inſtances ſhow that theſe often ariſe from the violently irritating morbid ſtimulus, even when the vital principle is languid.

It is quite ſufficient to have obſerved this in general on the nature of the hectic, ſo far as to give an idea of the diſeaſes, with which it is often accompanied; for the reſt nothing poſitive can be advanced of the hectic; ſince, as it is only a ſymptom of another diſeaſe, it differs according to the nature of the diſtemper, with which it is combined.

ORDER I.

Ulcers.

GENUS I.

Phthiſis.

The phthiſis is a waſting of the body, occaſioned by an ulcer of any internal organ. Thus phthiſis is a general name conſiſtent with all conſumptions, occaſioned by an ulcer in any internal organ of the body: for as experience teaches, that ulcers may occur in almoſt all the internal organs, it follows, that there exiſt as many ſpecies of phthiſis, as there are organs, the ulcers of which may occaſion the waſting of the whole body. Thus we find mention of the phthiſis of the brain, of the windpipe, of the lungs, of the pleura, of the heart, of the cawl, of the peritoneum, of the meſentery, of the ſtomach, of the inteſtines, of the liver, of the gallbladder, of the ſpleen, of the pancreas, of the kidneys, of the bladder, and of the womb*. It is not my intention ſeperately to treat of all theſe kinds of phthiſis, as it ſuffices for my purpoſe to lay down a general deſcription of this dreadful malady; therefore, by way of an example, I ſhall treat of the phthiſis

* S. G. Vogel, l. l. t. iv. kap. i, p. 14 & 15, kap. xi, p. 278, kap. xii, p. 288, and kap. xxiii, p. 423: Storck. *Ann. med. ſec.* p. 151 & 153. R. Vogel, § 213, p. 165 & § 234, p. 183: Selle *Rudim. Pyretol.* p. 297: and Tulpius *Obs. Med.* lib. iv, cap. xxiii, p. 328 & ſeq.

of the lungs, as it is more frequently met with than the others, the ſpecies, prognoſis, cure, complications, and conſequent manner of deſtroying of which I ſhall particularly notice.

Authors treating of the phthiſis of the lungs compriſe, in general, under it's name many other diſeaſes, in which no exulceration of the lungs takes place; and which thus, by no means, belong to this diſtemper, but ought rather to be ranked among the ſpecies of tabes. It appears to me indiſpenſable, to take notice of this errour: as it ſeems to be in a great meaſure owing to this that the moſt eminent phyſicians preſcribe ſuch remedies in this diſeaſe, as, if given in a real pulmonary conſumption, of which alone I here treat, would not merely prove uſeleſs, but even accelerate the death of the patient. The three following ſpecies ought to be diſtinguiſhed in the real phthiſis.

1, *Phthiſis from a hemoptyſis.* This principally ariſes from the habitual, and the cacochymic hemoptyſis: for the other ſpecies of this complaint do not change into a pulmonary conſumption, except under certain circumſtances.

2, *Phthiſis from an acute inflammation.* This it is, which ſometimes ſucceeds to the peripneumony.

3, *Phthiſis from a chronical inflammation, or the tuberculous.* This is the moſt frequent. It ariſes, for the moſt part, in ſcrofulous ſubjects, as is proved by the external appearance of the body; by the tumour of the lymphatic glands in the other parts,

which

which is often obſerved together with this phthiſis; and in fine, by the frequent complication of this complaint with the tabes of the meſentery, which is evidently of a ſcrofulous origin*. The illuſtrious Mead, after aſſerting, that ſuch perſons are the moſt liable to the exulcerations of the lungs, who had laboured under ſcrofula in their youth, obſerves that, according to the obſervations of Dr. Radcliffe, the phthiſis in our colder regions is moſtly of a ſcrofulous nature; and that the lungs are often found choked with tubercles, or indurated glands, in the bodies of perſons carried off by the pulmonary conſumption †.

As however there is no glandular ſtructure in the cellular connecting membrane of the lungs, theſe tubercles cannot be a morbid affection of the lymphatic glands. The ingenious Dr. Baillie is of opinion, that they are produced by an extravaſation of coagulable lymph into their ſubſtance during a previous attack of inflammation‡, which opinion has been confirmed by Mr. Aſhley Cooper by many preparations of ſuch bodies. This phthiſis is ſometimes produced by an induration of the blood-veſſels§: for, if any portion of the lungs become indurated, either from a peripneumony not radically

* Cullen, § 839. p. 385.

† *Monit. et Precept. Med.* p. 46.

‡ See his excellent Work intitled, *The Morbid Anatomy of the Human Body*, p. 66.

§ Cullen, l. l. § 856, p. 383: Stoll, *Rat. Med.* part i, de Pleuritide occulta ſive latente, p. 71 et ſeq.: Burſerius, l. l. t. iv, cap. iii, p. 48 et 51.

cured, or from a previous hemoptyſis, the ſame happens in the lungs, that we daily obſerve in the external parts of the body in boils not well ſuppurated: namely, that part of the boil, which has not undergone ſuppuration, though it often remains indurated during a long time, always retains a great propenſity to a freſh inflammation, ſo that any occaſional cauſe ariſing long after, the boil again inflames, and a ſuppuration is induced. In the ſame way this takes place in the tubercles of the lungs. In their commencement ſuch tubercles alſo do not excite the leaſt pain; nevertheleſs afterwards, eſpecially if any exciting cauſe occur, they are ſeized with a chronical inflammation, which, proceeding ſlowly, at length terminates in a ſuppuration, and produces many ſmall abſceſſes.

The chief ſymptoms of this diſtemper are emaciation and debility, attended with cough, peeviſhneſs of temper, hectic fever, colliquative ſweats, purulent expectoration, and diarrhœa. It ought however to be remarked, that, beſide theſe as it were characteriſtic ſymptoms of the phthiſis pulmonalis, many other ſymptoms are frequently met with in the conſumption of the lungs; but which vary according to the different ſpecies of the diſorder, and the various conſtitutions of the patients.

The prognoſis of this diſeaſe is always ominous, and for the moſt part, ſooner or later, it leads to death. The reaſon of this event is nevertheleſs not to be imputed to the flaccid ſtructure of the lungs, to their continual motion, and to the expoſition of the ulcer to the atmoſpherical air, as is commonly believed.

lieved. For theſe, though they really retard, and ſometimes impede the cure, are not ſufficient to explain it's fatal event: ſince all theſe circumſtances exiſt in every ulcer of the lungs, and yet phthiſis from a peripneumony is more ſeldom met with in theſe countries than the other ſpecies; and if the inflammation of the lungs change into a ſuppuration, nevertheleſs, the vomica being broken, there is often diſcharged a very good purulent matter, and the ulcer ſoon conſolidates. It is farther to be obſerved, that, though the conſequence of a hemoptyſis be a ſuppuration of the lungs, ſtill this diſorder is ſometimes ſoon cured; and that, if the body be in other reſpects ſound, and the patient have no prediſpoſition to the conſumption, a phthiſis ſcarcely ever ariſes from the accidental or periodical hemoptyſis *. Therefore the prognoſis of phthiſis, is, in my humble opinion, rather to be taken from the different ſpecies, and from the cauſe which brings on this diſorder. The ſtage of the phthiſis, too, ought always to be conſidered: for all the caſes, which are related, of the cure of perſons who had laboured under phthiſis for ſome years, and even as many as twenty, belong without doubt, to a certain ſpecies of tabes, and by no means to a true exulceration of the lungs; for, who can ſtill entertain hopes of a cure, when the lungs are, for the greater part, conſumed by ſuppuration? Indeed as long as phyſicians are unacquainted with the art of inciting nature to motions, which, with a certain plaſtic tendency as it were, might regenerate new lungs inſtead of the waſted ones, ſo long will no patient

* Cullen, l. l. § 864, p. 371, and § 898, p. 400: et Vogel, *Prælect. Acad.* § 271, p. 210.

ever

ever be recovered from a confirmed phthiſis: nay, though practitioners had diſcovered this art, all that labour under confirmed phthiſis would ſtill be carried off; as the organs of the human body are able to ſuſtain irregular and immoderate motions only to a certain degree, without unavoidable loſs of life. Conſequently, if the irregular motions be extended beyond this degree, not the leaſt hope of cure remains, and the vital principle is gradually extinguiſhed. This is not only true with regard to phthiſis, but alſo with reſpect to all other diſeaſes; and though the degree of morbid alteration of the ſolids that proves mortal in theſe diſtempers cannot always be previouſly determined, but differs according to the conſtitution; ſtill there exiſts a certain degree mortal to every perſon. Thus, for inſtance, Haller notes in his Elements of Phyſiology, that he had obſerved no patient recover, in whom, in any fever, the pulſe was more than a hundred and forty in the ſpace of a minute, but all ſuch died. I readily agree, therefore, with Cullen, that no one is ever recovered from a certain degree of conſumption, attended with colliquative ſweats, and diarrhœa.

Thus in the laſt ſtage of the pulmonary conſumption, the radical cure is beyond the power of phyſic: in the other ſtages, there appears greater or leſs probability of recovery, according to the ſpecies of the diſeaſe, it's cauſe, and the conſtitution of the patient. For inſtance, if a phthiſis ariſing from a peripneumony attack a ſtrong perſon, and it be properly treated in it's commencement, it is more eaſily cured than the other ſpecies, as is proved by

many

many inſtances of patients reſtored from it *. Great hopes, likewiſe, may be entertained in phthiſis from hemoptyſis, except it be of the habitual or cacochymic ſpecies: for, if the phthiſis derive it's origin from habitual hemoptyſis, the prognoſis is by no means equally favourable; as in ſuch caſes the phthiſis proves generally incurable, becauſe the phyſician cannot remove the bad confirmation of the thorax, which is the cauſe of this phthiſis: nevertheleſs, we need not then entirely deſpair of a cure; for ſometimes, the plethora of the lung-veſſels being continually kept off by proper treatment, theſe veſſels being rendered ſtronger by age, and the cauſe of the phthiſis being thus removed, the phthiſis itſelf is cured; of which Dr. Bennet records ſeveral inſtances †. But if an hereditary diſpoſition to phthiſis accompany the habitual hemoptyſis, then the diſtemper, according to the obſervations of Dr. Bennet, proves incurable: for he ſays, that "thoſe, "who have received an indelible impreſſion from "their parents, are incurable, though they protract "life longer than others ‡." Exceptions to this rule exiſt, however, as van Swieten relates, that a young man, who was attacked with phthiſis from habitual hemoptyſis, and in whom this diſorder was hereditary, was cured by Boerhaave §. The ſame author mentions ſome other inſtances, proving, that ſometimes this complaint, even when hereditary, may be vanquiſhed by a proper treatment. Laſtly, if the phthiſis ariſe from a cacochymic hemop-

* Van Swieten, l. l. t. iv, § 1206, p. 63: Burſerius, l. l. t. iv, cap. iii, p. 61: and Cullen, § 898, p. 401.

† L. l. p. 101. ‡ L. l. p. 99. § L. l. t. iv, § 1207, p. 89.

tyſis,

tyſis, it commonly brings on death, on account of the weakneſs of the general ſyſtem: the prognoſis is nevertheleſs different, according to the different diſeaſe with which the phthiſis is then accompanied. The prognoſis of a phthiſis from a chronical inflammation, or from a tuberculous one, is very ominous, as this moſt dangerous ſpecies of the phthiſis commonly bids defiance to all the remedies in the power of phyſic, and has uſually a fatal termination. The reaſon, why the tuberculous phthiſis ſo often proves fatal, is, becauſe this phthiſis is always produced from an inflammation of the ſcrofulous tubercles, or of the indurated veins.

Now how difficult it muſt be to cure this in ſuch delicate organs, and ſo remote from the operation of medicines, needs no demonſtration: eſpecially as very often all theſe tubercles are not ſeized with the inflammation at the ſame time, but one after another, ſo that both an inflammation and a ſuppuration take place in the lungs at once; to reconcile the indications of which is by no means eaſy. Beſide theſe reaſons, there exiſts ſtill another of no leſs weight; namely, that when the ulcerating proceſs has been allowed to go on in theſe tubercles during ſome time, the intermediate ſubſtance of the lungs generally becomes much firmer, and undergoes a certain degree of induration; the blood-veſſels round the boundaries of theſe ſmall abſceſſes are very much contracted, and the air cells in a great meaſure obliterated; the lungs ſuffer thus a degeneracy of their organic compoſition. Now who can hope radically to cure the diſeaſe, after it has produced ſuch a conſiderable alteration in the organ-

iſm

iſm of the lungs? This ſpecies of phthiſis, therefore, though difficult, in general, to be removed, may ſtill be cured in it's commencement; but when the complaint has already continued for a long time, it becomes incurable.

As it is demonſtrated by ſound reaſoning, that the tuberculous phthiſis, eſpecially in a late period, muſt generally prove fatal, ſo it is likewiſe confirmed by the obſervations of practitioners. Mead ſays, that an impoſthume of the lungs, though a ſerious complaint, and often terminating in a conſumption, is notwithſtanding attended with leſs danger, than theſe ſmall exulcerations *. Cullen declares them to be very dangerous, and almoſt always mortal, when an hereditary prediſpoſition is united with them †. Burſerius obſerves, that this phthiſis is the worſt of all ‡: and much confirming this may be found in van Swieten §, who not only agrees with the reſt in this matter, but alſo relates many obſervations and diſſections of ſuch bodies, all which corroborate what I have ſaid above on the tuberculous phthiſis.

The indications of cure requiſite in every phthiſis are the three following:

1, To abate the inflammation.

* *Monit. & Præcept. Med.* p. 53.

† L. l. § 898, p. 401.

‡ L. l. t. iv, cap. iii, p. 61.

§ L. l. t. iv, § 1205, p. 59 et ſeq.

2, To

2, To avert all cauſes, which may irritate the lungs.

3, To change the exulceration of the lungs into a ſimple ulcer, and thus to promote it's conſolidation by the *natura medicatrix*.

Theſe indications, though to be obſerved in every ſpecies of phthiſis, are yet not to be anſwered in the ſame manner, and with the ſame remedies, in all. It is neceſſary, therefore, to treat ſeparately of each.

1, *Phthiſis from hemoptyſis.* The pulmonary conſumption from habitual hemoptyſis is to be cured with the ſame remedies, by which the tranſition of the hemoptyſis into phthiſis was to have been prevented. For as a propenſity of the blood to an inflammatory ſtate, with a certain ſpecies of plethora, ariſing from a bad conformation of the thorax, always exiſts in this phthiſis; ſound reaſon dictates, that whatever incites either the orgaſm, or inflammation of the blood, ought to be avoided with the greateſt care. Thus alum, ſteel, elixir vitrioli, oxymel ſcilliticum, Iceland liverwort, bark, myrrh, polygala amara, and rattleſnake-root, ſhould be omitted in theſe caſes. The ſame may be ſaid of the milk diet. Indeed what can ſtimulants, aſtringents, and tonics, effect here? or with what view can milk be given to ſuch patients? In reality all theſe muſt from their nature again excite hemoptyſis, and quickly render this phthiſis mortal, by increaſing the quantity and orgaſm of the blood, and by inciting the inflammation,

and

and fever. The emollient, oily, mucilaginous, and demulcent medicines are likewiſe found to be of no utility: for theſe were preſcribed by the ancient practitioners, to temper an acrimony of the fluids, which by no means exiſts. Nay even in all other pulmonary conſumptions theſe medicines ought to be cautiouſly given, becauſe, though they mitigate the cough, they by no means act on it's cauſe; but, on the contrary, often increaſe the complaint by producing too great a relaxation of the lungs. Beſides, they extremely weaken the tone of the *primæ viæ*, ſo that, while you provide for the lungs, the alimentary canal is frequently reduced to need help. In fine, though I have ſeen them frequently employed, yet I never obſerved any permanent relief from their uſe; and even, by their diſturbing the function of the ſtomach, the hectic fever is not unfrequently increaſed. Dr. Bennet therefore juſtly obſerves, that though it is a general cuſtom to calm the cough by demulcents, yet you muſt be cautious, leſt the root itſelf increaſe, amid the defalcation of the branches; for that ſuch medicines often occaſion more injury than benefit, and that he has obſerved many diſorders from their abuſe*. Whereas ſmall, but repeated bleedings, the uſe of the juice of cucumbers†, a low and abſtemious diet, and the avoiding of all violent exerciſe and motion, are proper; for by theſe the patients are either radically cured, or, at leaſt, always experience much relief, and are preſerved alive during many years. I have ſeen a remarkable inſtance of it in one of

* L. l. cap. xxvii, p. 69 & ſeq.

† Murray, l. l. t. i, p. 58 et ſeq.

my

my relations, who is a phyſician himſelf. At the age of twenty four he laboured under a phthiſis pulmonalis, brought on by habitual hemoptyſis; yet by making uſe of the preſcribed treatment he not only kept himſelf alive; but the plethora of the lungs gradually diminiſhing, and the lung-veſſels being rendered ſtronger by age, he gradually amended, and lives now in a pretty healthy ſtate, being at preſent about fifty two years old. It ought however to be obſerved, that much ſkill and management of the practitioner is required in the treatment of this complaint; as it is a matter of indifference to the patient whether he be killed by the attempt at ſtrengthening the lungs by tonics, or by uſing the lancet. The antiphlogiſtic regimen is doubtleſs often carried too far; for the irritable and delicate conſtitution of ſuch patients cannot bear either the loſs of any conſiderable quantity of blood, or the ſuperabundance of it. Beſides, it ought always to be kept in mind, that ſuch patients do not labour under an univerſal plethora, but only under a local one of the lung-veſſels. Let the patient, therefore, carefully avoid all but moderate exerciſe and motion; keep him low by a cooling and aceſcent regimen, by the uſe of the juice of cucumbers and of fruits of all kinds, and by the rendering the body open by gentle purgatives: draw alſo occaſionally blood from time to time, but be on your guard not to take it away in large quantities, otherwiſe inſtead of good you will do a great deal of miſchief; and as the patient becomes advanced in age, the blood is gradually more and more ſparingly to be drawn, and the intervals between the bleedings ought to be longer.

In phthiſis occaſioned by the other ſpecies of hemoptoe, the cure wholly depends on the ſymptoms, ſo that when the inflammatory diſpoſition prevails, the antiphlogiſtic regimen ought to be purſued: if, on the contrary, the inflammatory diſpoſition be removed, and the ſyſtem, as is generally the caſe, appear to be debilitated, the bark, ſteel, myrrh, and bitters, are to be given, in order to ſtrengthen the lungs, and to furniſh nature with ſufficient power to heal up the ulcer.

2, *Phthiſis from peripneumony.* In the firſt ſtage of this phthiſis the antiphlogiſtic regimen ought likewiſe to be adopted. As, nevertheleſs, the inflammation of the parts bordering upon the ulcer is generally much leſs in this ſpecies, than in the former, the firſt ſtage often ſoon paſſes over, and the inflammation of the neighbouring parts being wholly removed, the pulſe is frequently found weak, and ſoft, the vital powers are enfeebled, and the patient expectorates a great quantity of fetid matter. Under ſuch circumſtances, the bark, ſteel, and myrrh, are to be employed; with which, according to the ſymptoms, the elixir vitrioli, and various other medicines may be joined, by the uſe of which the tone of the parts is often reſtored, the expectoration confined within certain bounds, and the ulcer cleanſed. The polygala amara, the rattleſnake-root, and the Iceland liverwort, may alſo be uſeful in ſuch caſes. Theſe medicines however ſeldom agree in a true pulmonary conſumption, at leaſt I have never obſerved any good effects from the firſt or ſecond; and as to the Iceland liverwort, though it ſometimes afforded relief, yet it was

never found capable of performing a radical cure. The medicines I have seen used with advantage are the bark, steel, and myrrh, the last given from ℈ii to ʒii during twenty four hours.

In this phthisis cases sometimes occur, in which the physician ought to have recourse to the tonics from the commencement of the disease; namely, when the exulceration of the lungs attacks weak, flaccid subjects, not inclined of themselves to an inflammation. The constitution of such patients is often soon broken, the pulse is found to be very weak, and ichor is secerned instead of a good purulent matter. If in such a case the antiphlogistic treatment were still continued, it is to be feared, that the patient would die under the very operation of bleeding. Here, therefore, where the vital powers languish, the tonics are to be administered, for the purpose of increasing the tone of the vessels, and changing the ichor into a good purulent matter.

The practitioner ought however to begin with the exhibition of the tonics in small doses, and in conjunction with remedies diminishing the hectic fever; such as the sarsaparilla, and the dulcamara; and afterwards, when the patient is accustomed to these, he should proceed by degrees to large doses, as otherwise it is to be feared, that a fresh inflammatory state of the ulcer might be excited by the tonics themselves. This I have frequently observed to be the consequence of an imprudent administration of tonics in too large doses; for the irritability of phthisical patients is in general so great, that

I have ſometimes ſeen, even in caſes of hectic attended with early debility and little apparent inflammation, that by the uſe of tonics the pulſe became quicker and hard, the cough more ſevere and dry, the reſpiration more difficult, and the expectoration ſuppreſſed. My worthy friend Dr. Ooſterdyk, profeſſor of the practice of phyſic at the univerſity of Leyden, and ſeveral other eminent phyſicians of Holland, aſſured me, that they had frequently witneſſed the ſame phenomena in phthiſis, after giving the bark.

Sometimes it happens, that in theſe caſes the expectoration becomes ſuppreſſed by the languor of the ſolids; eſpecially in cold indolent temperaments, of a lax fibre. Stronger ſtimulants are then required, ſuch as ſulphur aurat. antim., kermes minerale, and oxym. ſcillit., in order to promote the expectoration.

In caſes in which a large quantity of matter is diſcharged by expectoration, and the patients experience an almoſt continual coughing, in order to delay the irritation brought on by the ſevere cough, and to promote the healing up of the ulcer by clearing it from the ſecerned pus, nothing proves more ſalutary, than an emetic, given in the evening every other day; which effectually clears the ulcer of it's contents; and, by taking off the irritation, acts as a ſedative and prevents in a great meaſure the cough, thus greatly promoting the conſolidation of the ulcer.

3, *Tuberculous Phthiſis.* The practitioner ought, in this phthiſis, to attempt to reſolve the inflamed tubercles by ſmall and repeated bleedings, ſuited to the conſtitution of the patient, and the degree of inflammation; by keeping the body open; and by the antiphlogiſtic regimen. The inflammatory ſtate being removed by theſe means, recourſe is to be had to tonics; which, however, at the commencement, ought to be given but in a ſmall doſe, and combined with aperients: for I have found by experience, that the ulcers not unfrequently become inflamed again, in conſequence of an oppoſite mode of proceeding. By degrees the doſe of the tonics is to be increaſed, till at length they alone accompliſh the cure; and, by ſtrengthening the lungs, they prevent theſe organs from being afterwards ſo ſuſceptible of being affected by catarrh and inflammation. The tonics from which I have obſerved the greateſt benefit, are myrrh, ſteel, bark, and bitters. I do not ſpeak of the milk diet, as I have found, that thoſe, who labour under this phthiſis, cannot bear milk, and the hectic fever is exaſperated by it's uſe. Vomits are ſtrongly recommended by ſome moderns, eſpecially in this ſpecies of phthiſis. Now from what I have ſaid before of their uſe, it is evident, that they may be employed with great benefit to the patients under two circumſtances. Firſt, when given before the inflammation of the tubercles takes place, they often prevent the phthiſis from coming on: for emetics are frequently found to be a very powerful remedy for the diſperſion of the tubercles, while they are as it were ſtill quite crude. Secondly, when the inflammatory ſtate of the tubercles is nearly removed, little heat and inflammation remain

remain, and the ſyſtem appears to be weakened, we may join with tonics the adminiſtration of emetics at night; not only with ſafety to the patient; but with conſiderable advantage in the cure of the complaint, by their cleanſing the ulcer, and removing the irritation brought on by the continual coughing. It appears then, that vomits prove ſalutary in this ſpecies of the pulmonary conſumption both previous to the inflaming of the tubercles, and after their inflammation has been removed: on the contrary, in the early ſtage of this diſeaſe, when the tubercles are in an inflamed ſtate, when there is much fever, heat, and inflammation, it is ſufficiently evident, that, as theſe circumſtances require all irritation of the ſyſtem to be carefully avoided, vomits, by the ſhock they give the whole body, cannot but do miſchief.

Other practitioners from the commencement of the diſeaſe uſe tonics, eſpecially the bark and myrrh, in large doſes, in conjunction with an animal diet. But though I willingly allow, that the efficacy of the bark in ſcrofulous diſorders is beyond all doubt; though I am perfectly ſatisfied, that, the inflammatory ſtate of the ulcers being removed, myrrh has a conſiderable ſhare in healing them; though, in ſhort, I grant, that the inflammation of theſe tubercles, being chronical, does not in general require ſuch copious and repeated bleedings as an acute one; and that, after the inflammatory ſtate has ſubſided, tonics ought always to be given to accompliſh the cure of the complaint, and to prevent any relapſe by ſtrengthening the lungs: yet ſuch a practice ſeems to me to be raſh and irrational, and cannot

but in general prove hurtful and fatal. For if we conſider the tender and delicate ſtructure of the lungs, ſo liable to become inflamed, and the violent ſtimulus that muſt be communicated to the inflamed lungs by ſuch remedies, the natural inference is, that ſuch medicines are highly injurious in the inflammatory ſtage of the pulmonary conſumption; the more as experience teaches us, that perſons having laboured under ſcrofula in their youth, afterwards live in a pretty healthy ſtate for many years, till at length, from the acceſſion of the exciting cauſe, the dormant complaint manifeſts itſelf; that is, the crude tubercles become inflamed, the inflammation changes into the ulcerating proceſs, and thus gives riſe to the tuberculous phthiſis. Now it is well known, that ſtimulating remedies prove a very powerful exciting cauſe of the inflammation of the crude tubercles; how then, is it to be believed, that remedies, which by their ſtimulating quality would even bring on a tuberculous phthiſis, can be uſeful in the inflammatory ſtage of the diſorder? Does it not naturally follow, that, on the contrary, ſuch remedies muſt inflame the neighbouring parts, inſtead of ſubduing the inflammatory ſtate of the ulcers? This is the more evident, as we daily ſee, that phthiſical patients, though already convaleſcent, by not obſerving the precepts of the phyſician who attends them, as is unluckily too often the caſe, and imprudently expoſing themſelves to foggy weather, again become much worſe, even by a ſlight catarrh. Though, therefore, myrrh, bark, bitters, and ſteel, prove uſeful in caſes attended with little heat and inflammation, yet in the firſt ſtage of the phthiſis ſuch remedies ought to be entirely omitted.

And

And even in cases of early debility, tonics are in the commencement to be exhibited but in a small dose, as when imprudently used directly in a large quantity, far from being of real service to the patients, they frequently again excite a fresh inflammation.

Now what is evident from sound reasoning of the hurtful effects of the tonics in the commencement of this disease is likewise confirmed by the observations of practitioners. It will be sufficient here to adduce the words of one of the most eminent physicians of this century: who says, "I have seen "the bark given in almost every state of the *phthi-* "*sis pulmonalis*, even in the first commencement, "whilst the breast was in pain, the cough dry and "harsh, the pulse quick, and hard, and the heat "considerable. What was the consequence? fre- "quently an hemoptysis, and all it's worst attend- "ants, ulcerated lungs, purulent spitting, colliqua- "tion, and death *." But if the bark, on account of it's stimulating power, be injurious in the early stage of the disease, how much more carefully ought not the use of steel and myrrh to be avoided? I could produce many instances of the detriment they have occasioned, when imprudently exhibited under such circumstances, were not sound reasoning alone quite sufficient to prove, that they cannot fail to be productive of bad effects.

But if the phthisis no longer admit of cure, on account of the alteration in the structure of the lungs, or of the advanced stage of the disease, the patient is

* Fothergill *Med. Obs. and Inq.* vol. v, art. xxxiii, p. 348.

not to be abandoned to his fate: for, though the diſtemper proves incurable in ſuch caſes, the art of phyſic can furniſh many ſuccours, by which the complaint may be alleviated, and life protracted for a long time. For this purpoſe different medicines ought to be employed, according to the circumſtances: thus, if the patient ſtill enjoy ſufficient ſtrength, and there exiſt marks of an inflammatory ſtate of the tubercles, every thing that is capable of abating inflammation proves ſalutary: ſo that ſmall but frequent bleedings, the antiphlogiſtic regimen, the juice of cucumbers, a low and abſtemious diet, and whey, on account of it's ſlightly nutritious, aperient, and antiphlogiſtic virtues, are found to be of great utility. Whereas, if the ſymptoms of inflammation be wanting, and a general decay of all the powers be obſervable, the above remedies would prove mortal; and in ſuch circumſtances, tonics, eſpecially the bark, ſteel, and myrrh, ought to be given; as the benefit of ſuch remedies in theſe caſes is demonſtrated by the obſervations of practitioners, of whom it will ſuffice to adduce Quarin and Morton alone. The former of theſe phyſicians records, that a decoction of the bark had always proved uſeful in the above circumſtances*; and theſe are the words of the latter, "I have very often experienced the efficacy of "the bark when frequently and repeatedly taken "at due intervals, for ſuppreſſing the feveriſh paroxyſms, at leaſt for ſome time, ſo that I have ſeen "ſome phthiſical patients already given over, who "protracted life by it's uſe not only during many "months, but even for ſome years; and who, though

* L. 1. cap. 3.

not

" not radically cured, were nevertheleſs delivered " from the fever by it's uſe, and could go through " their daily occupations with tolerable eaſe *."

What is here aſſerted with reſpect to the bark holds alſo good with regard to the myrrh and ſteel, from which remedies I have obſerved much benefit in ſuch caſes: and even by the lichen Iſlandicum, though inferiour to the efficacy of the above remedies, I have ſometimes ſeen patients very much relieved.

With reſpect to the regimen of the patients in this complaint, upon which the cure in a great meaſure depends, in the early ſtage of the diſeaſe the cooleſt and moſt acefcent diet ought to be preſcribed; meat is not to be given, except in a ſmall proportion; wine, ſpirits, and all kinds of ſtimulating food and drink ought to be forbidden; on the contrary, in a more advanced period of the diſorder, when the inflammation is ſubſided, ſuch a regimen would do miſchief: for in all caſes of debility, where we recommended the uſe of tonics, the patient is to be indulged in the uſe of animal food, and of wine in a moderate quantity, which, far from being injurious, have a conſiderable ſhare in the removal of the complaint. As all irritation of the lungs proves hurtful, and as the perſpirable fluid, when retained in the body, is frequently conveyed to the weak lungs, and excites a freſh inflammation, the greateſt care ought to be taken, both that the patients continually enjoy a moderate degree of perſpiration, and that the quan-

* *Phthiſol.* lib. 2, cap. 10, p. 101 & 102,

tity

tity of blood flowing towards the lungs be diminiſhed by ſoliciting it towards the ſurface; which indications are beſt anſwered by avoiding cold, by wearing flannel under-waiſtcoats, and by moderate exerciſe.

I have not mentioned milk among the remedies uſeful in this diſeaſe, as reaſons are not wanting which forbid it's uſe in the real pulmonary conſumption: for milk proves injurious in all caſes, where an inflammatory ſtate exiſts, on account of it's caſeous part. It is likewiſe ſo far from being ſuitable in the tuberculous phthiſis, that I have often ſeen the complaint increaſed by it. And in other caſes, when the inflammation is wholly removed, the enfeebled organs of digeſtion are generally unable to convert it into a proper chyle: ſo that milk, corrupted in the ſtomach, not only fails of the deſired effect, but beſides often produces many diſorders in the *primæ viæ*. Hence, though I readily admit, that milk ſometimes greatly contributes both to prevent the phthiſis, and to ſtrengthen the body when the diſtemper is already cured, yet I think, it is better to give it's whey in the phthiſis itſelf. Nay even the father of phyſic was conſcious, that milk was not advantageous in the real phthiſis. For though he recommends the uſe of milk to the conſumptive *, yet he adds ſo many cautions, and records ſo many ſymptoms, which forbid it's uſe, that, if milk be to be given to the tabid, according to the rules laid down by the venerable Hippocrates, it in fact ought never to be uſed in a real pulmonary conſumption; for it would not be

* Aphoriſ. ſect. v, aphoriſ. 64.

eaſy

eaſy to find a phthiſical patient, in whom either one or other of the ſymptoms forbiding it's uſe is not to be obſerved. It is evident, therefore, that this moſt reſpectable author condemned the uſe of milk in a real phthiſis; and his authority is of the more weight, as it is certain, that he never proceeded farther than his obſervations led him. Bennet is of the ſame opinion, for he ſays, " Though it is very " adviſable to give milk, when the firſt ſtage of the " ſymptoms accompanying the phthiſis already " appears to be approaching, nevertheleſs it is ne- " ceſſary entirely to forbid it's uſe to the really " phthiſical, and to ſubſtitute in it's ſtead whey, " mineral waters, and medical potions, varied ac- " cording to the circumſtances*." And though the moderns in general have not paid due attention to the admonitions of theſe phyſicians, yet there are ſome among them, who agree, that milk proves uſeleſs in this diſorder. For inſtance, Gilchriſt ſays, " Whilſt we willingly allow the uſe of milk " all the merit, to which it is juſtly entitled, we " cannot, through mere deference to cuſtom and " authority, ſuppreſs one thing, to wit, that it fails " in almoſt every inſtance †." I can confirm the teſtimony of this author by my own obſervations, having very often ſeen milk given in this diſtemper, without ever obſerving any conſiderable benefit from it in a real pulmonary conſumption.

In the laſt ſtage of the phthiſis, the palliation of ſome ſevere ſymptoms requires a particular attention. The cough is to be moderated by

* L. 1. cap. xxvii, p. 67 & 68.

† *On the Uſe of Sea-Voyages*, p. 123.

the

the exhibition of opium and dulcamara; the diarrhœa by abſorbents, aſtringents, and opiates; the colliquative ſweats, by the elixir vitrioli, lime water, a decoction of the bark, and a cold infuſion of the flowers of ſage; by exhibiting theſe remedies occaſionally, the urgent ſymptoms are to be alleviated, and the patient's life is made as comfortable, as in ſuch a ſituation can poſſibly be expected.

As to the uſe of iſſues, ſetons, and bliſters in this diſtemper, Fothergill is of opinion, that they are uſeful, when the phthiſis is produced either by the *metaſtaſis* of ſome morbid matter, the repulſion of any cutaneous diſtemper, the conſolidation of any inveterate ulcers, or a ſcrofulous diatheſis: but that, when the phthiſis is produced by other cauſes, "to preſcribe iſſues, or bliſters, ſeems "to be inflicting a certain pain, or perhaps "a grievous inconveniency to obtain a very uncer-"tain advantage*." And in reality I have ſeen ſeveral caſes in which iſſues were tried with no happy event. A great quantity of purulent matter was indeed diſcharged by them; but the patients became greatly emaciated, and weakened by it, and death quickly ſucceeded. From which caſes it may at leaſt be inferred, that ſuch remedies are to be cautiouſly employed in a pulmonary conſumption, not occaſioned by the above cauſes; eſpecially in a more advanced ſtage of the diſorder. But with regard to bliſters I cannot agree with this eminent phyſician, ſince theſe on many occaſions may be uſefully applied in phthiſis not originating from the above cauſes, during the whole courſe of the diſeaſe.

* *Med. Obſ. and Inquir.* vol. v, art. 33, p. 373 & 374.

Authors

Authors greatly diſpute on the kind of air, that is moſt ſuitable in this diſeaſe; ſome recommend a pure air; others on the contrary a leſs pure one. The diſpute, however, may be eaſily compromiſed, as there indubitably exiſt ſome caſes, wherein an air more pure than uſual is advantageous: and others are not wanting, where ſuch an air would prove detrimental. For in all caſes, in which an exceſs of the vital powers takes place, air containing but a ſmall quantity of oxygen is ſalutary; and, on the other hand, where a torpor of the vital powers accompanies this diſtemper, the air is found to be more beneficial, according to the degree of it's purity. From this rule it may readily be perceived, in what caſes ſea-voyages towards Italy, Portugal, Spain, and the ſouth of France are advantageous; and when, on the contrary, they do miſchief, and the uſe of the carbonic acid gas may be ſubſtituted inſtead of them with benefit to the patient.

As to the balſams, by the internal uſe of which ſome phyſicians endeavour to conſolidate the veſſels of the lungs, I willingly agree with Stoll, that it is an erroneous practice, introduced to the deſtruction of many patients*; and indeed it will be evident to every one, from what I have proved above, that they who make uſe of theſe hot and ſtimulating medicines to cure the ulceration of the lungs, may be compared with thoſe, who would extinguiſh a flame by the effuſion of oil. But if there be ſtill practitioners, who think the uſe of ſuch remedies proper in this diſtemper, I refer them to the ingenious diſſertation written by the renowned phyſician

* *Rat. Med.* pt. 3, p. 12.

Fothergill on the injury of the balſams, and the evils which generally accompany their internal uſe *: and I have not the leaſt doubt, but that every one of them will in future deſiſt from giving ſuch medicines internally. I have ſeen the balſams tried, indeed, in ſome caſes, but the effects were ſo unfavourable, that they were ſoon laid aſide.

This diſeaſe, ſo dangerous even when alone, is ſtill frequently complicated with other diſorders. It is indeed true, that, *ceteris paribus*, thoſe, who labour under phthiſis, are leſs inclined to the reigning epidemic, than perſons in ſound health; yet there exiſt inſtances of the phthiſical being alſo affected by it. Stoll mentions, that a painter, who had laboured under the phthiſis for three years, came to him greatly emaciated in the year 1779, during a very inflammatory epidemic. He was bled a few times in a ſmall quantity, and died unexpectedly at the end of ſix weeks. The body being opened, both lobes of the lungs were found heavy and greatly inflamed; the right lobe alſo exhibited here and there ſmall abſceſſes, the ſource of the purulent matter during life †. From this caſe it appears, that an epidemic can be communicated to a phthiſical patient, provided a proper affinity exiſt between the two diſorders.

For brevity ſake I ſhall not ſpeak of the frequent complication of phthiſis with tabes, and other diſeaſes; though I cannot forbear mentioning, that

* L. l. t. iv, art. xxviii, p. 231 & ſeq.

† Stoll, l. l. pt. iv, p. 38 & 39.

conſumptions

conſumptions of different parts ſometimes not only exiſt in the ſame body, but alſo, that phthiſis of one part not unfrequently gives riſe to that of another. Thus it happens ſometimes in the phthiſis uterina, that the lungs become inflamed by ſympathy, and a real pulmonary conſumption takes place in conſequence *. It is evident, that in ſuch caſes the diſeaſe is abſolutely incurable; and that theſe two phthiſes muſt deſtroy life: the more, as this accident happens particularly to ſuch women, as have either laboured under hemoptyſis in their youth, or whoſe lungs are naturally weak. I twice had an opportunity of obſerving the pulmonary conſumption brought on by phthiſis uterina; both happened in delicate females, after a laborious labour; both had been affected ſome years before with hemoptyſis; and in both the diſorder terminated fatally.

I have treated more fully of the pulmonary conſumption, than the compaſs of this treatiſe could well permit, on account of the great number of perſons continually carried off by this diſorder. It was alſo the more neceſſary to make an accurate inquiry into the nature of this complaint, and to endeavour to lay down general rules for it's cure, as almoſt every year different treatiſes on the pulmonary conſumption are publiſhed, which, recommending quite oppoſite methods of treatment, cannot but prove injurious to perſons who labour under this diſorder. The manner of treatment I recommend is founded upon ſound principles, and will I believe be farther confirmed by the obſervations of practitioners; at leaſt

* S. Vogel, l. l. t. iv, kapitel xxiii, p. 324.

I have

I have had ſome opportunities of ſeeing a radical cure effected, and more of conſiderable relief afforded by it. Moreover, as it is one of my principal deſigns, not ſimply to mention, in what manner the patients are carried off by any diſeaſe; but eſpecially to explain, as far as poſſible, how the manner of killing is conſiſtent with the nature of the diſeaſe; I was obliged to be more copious in regard to the treatment of phthiſis, in order to ſhow, that the difference of the ſymptoms obſerved in the different ſpecies during the courſe of phthiſis, is no proof of the inconſiſtency of nature, as it were, in this diſorder; as perhaps ſome might think, to whom all the forms of the diſtemper are not accurately known. Thus, on comparing together all that I have laid down on the different ſpecies of phthiſis, it will be evident, that, though exhibiting various ſymptoms, they ſtill agree in this, that the life of thoſe, who expire by any ſpecies of phthiſis, is always extinguiſhed by ſlow degrees like the light of a lamp. The reaſon, why all phthiſical patients are carried off in ſuch a manner, ſeems to be two-fold: in the firſt place, ſome organ requiſite to life is conſumed by the ulcer, from the total conſumption of which organ the life of the whole body muſt neceſſarily be deſtroyed: ſecondly, the ſolids grow daily more and more enfeebled by the morbid ſtimulus continually operating on the whole body, ſo that it's tone is at length wholly relaxed. That indeed death happens to the phthiſical in ſuch a way will be particularly evident, if we attend to the phenomena, which, in general, are obſerved towards the end of the diſeaſe, in thoſe, who labour under any ſpecies of pulmonary conſumption. For at

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this period the thruſh breaks out in the mouth, palate, and throat, exciting pain and heat in ſwallowing; the voice becomes hoarſe, and ſometimes fails; a fetid ſmell ariſes not only from the breath, but alſo from the whole ſurface; pimples ſometimes deform the wriſts; an œdema both of the feet and hands takes place; a diarrhœa enſues; the temples fall in; the eyes ſink; the noſtrils become pinched; the patient is ſcarcely any thing but ſkin, and bone; the hair falls off; the nails grow curved, and the ends of the fingers bulbous; a delirium not unfrequently occurs; the expectoration is ſuppreſſed; the cough is calmed, but reſpiration is very difficult and anxious; the pulſe languiſhes, flutters, and fails: thus death ſlowly ſteals on, and, ſcarcely ever foreſeen by the patient, cloſes the ſcene.

GENUS II.

Caries.

Caries is an ulcerating proceſs of the bones, attended with more or leſs loſs of oſſeous ſubſtance, a diſcharge of a thin ichorous fetid matter, and a roughneſs of the affected part, which may be eaſily diſcovered by the introduction of a probe.

This diſorder is generally confounded with the necroſis oſſium; but though caries, when not ſpeedily remedied, uſually terminates in necroſis, yet theſe two diſorders are as diſtinct as the ulce-

rating proceſs, and the ſphacelus of the ſoft parts: for caries may be cured without the leaſt portion of bone coming away; necroſis, on the contrary, is only to be removed by the ſeparation of the dead bone; in the caries, the affected bone either retains it's natural healthy appearance, or is of a pale white colour; whereas, in necroſis, the bone is of a yellow, brown, or even black hue. It is, however, to be confeſſed, that the limits between caries and necroſis are not always diſtinct; and the practitioner is often at a loſs, whether the diſeaſe in queſtion be caries or necroſis; the more, as on account of the blood-veſſels in bones being far leſs numerous, in proportion, than in the ſofter parts of the body, the former almoſt invariably changes into the latter, when any conſiderable injury has been done to the bone; and there are no certain characters to diſtinguiſh between the termination of the caries, and the beginning of the necroſis. The reaſon why caries at length generally terminates in necroſis, ſeems to be the following. Inveterate ulcers of the ſoft parts, we know, are often not to be cured, but by deſtroying the old ſurface by means of the cauſtic, ſo as to make a new one; becauſe, by the long continuance of the diſorder, the ſurface of the ulcer is degenerated ſo much as to be incapable of producing healthy granulations. Now as this is not unfrequently the caſe in long continued ulcers of the ſoft parts, certainly it is eaſy to be underſtood, why inveterate ulcers of the bones, which even in their recent ſtate heal with difficulty, are not in general to be cured but by the exfoliation of the degenerated portion of the affected bone: the deſtruction of the diſeaſed part is uſually requiſite

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to the cure of them both in their inveterate ſtate; the only difference is, that in one caſe it is generally deſtroyed by art, and in the other by the *natura medicatrix*.

As the caries is an ulcer of the bones, it is evident, that all cauſes, which bring on an inflammation of the bones, may, under certain circumſtances, occaſion caries. Of courſe, wounds, violent contuſions from a fall, or blows on the part, ulcers and inflammations of the perioſteum, and the improper application of ſharp acrid ſpirits and powders to the bones merely laid bare by an accident; a practice, of which the ancient ſurgeons were ſo fond; in a word, whatever affects either the perioſteum or the bones may produce caries. Experience however proves, that the perioſteum is very frequently deſtroyed, and that even ſometimes a very conſiderable loſs of ſubſtance of the bone does occur, without any carious affection enſuing; therefore for the production of caries there ſeems to be requiſite, at leaſt in moſt caſes, either a diſpoſition of the bones of the ſyſtem in general, or of thoſe of the affected part in particular, to contract the diſorder, when any proper exciting cauſe takes place.

The prognoſis of caries depends upon a variety of circumſtances. The nature of it's cauſe, the ſituation of the diſeaſed part, the texture of the affected bone, the extent of the ulcer, and the age and habit of the patient, are chiefly however to be taken into the account. Thus caries ariſing from an external cauſe is in general more eaſily cured,

than that which originates from any conſtitutional complaint: the caries ſucceeding to a wound of the bone is uſually much leſs troubleſome, than that which follows after a contuſion of it: when the diſeaſe takes place in any of the bones of the ſkull, ribs, or vertebræ, it is attended with more riſk, than caries in any of the bones of the extremities, on account of the diſeaſed parts being ſituate ſo near to organs neceſſary to life: caries attacking the middle of the bones, is more eaſily remedied, than when the diſorder attacks their ends, in which caſe the neighbouring joints often become affected: the deeper the caries penetrates into the ſubſtance of the bone, the more danger there is of an unhappy termination of the caſe; the greater the extent of the ulcer, the more time is requiſite for it's healing: in fine, the age and habit of the patient are circumſtances, which conſiderably influence the cure; for old people, and perſons of a bad conſtitution, uſually ſink under the diſeaſe.

With reſpect to the treatment of caries the practitioner ſhould always accurately conſider whether the diſorder be a conſtitutional complaint, or a local diſeaſe of the bone, in conſequence of an external injury. In the firſt caſe, the remedies, which remove the cauſe of the caries, will for the moſt part remove the diſorder itſelf: but if the caries were brought on by an external cauſe; if it be of a ſcrofulous origin; or if the remedies ſuited to the removal of it's cauſe, ſuppoſing the caries to be a conſtitutional complaint, do not ſeem to have any effect on the diſeaſed bone; aſafœtida, given

from ℈ii to ʒii a day, will be found very efficacious, both in caries and in necrosis ossium. Under it's use, the ulcer puts on a more healthy appearance, the discharge becomes mild and of a good consistence, it promotes considerably the exfoliation of the bone, and the ulcer heals. For the first account of the efficacy of the asafœtida in this disease we are indebted to Mr. Schmucker, surgeon-general of the army of the late king of Prussia, in whose work there are recorded several cases of caries, which proved obstinate to all other remedies, but were cured by the exhibition of the asafœtida *. On his authority, I gave this remedy to a girl of ten years of age, who laboured under a caries of the lower part of the femur, communicating with the knee-joint. The disorder had continued for two years when I saw her, and a variety, both of external and internal remedies, had been tried, but without success. She took the asafœtida to the quantity of a drachm a day for some weeks, with such effect, that several pieces of bone came away, the ulcer closed up, and the girl did perfectly well, though the motion of the knee-joint was in a great degree lost. Since this I have had several opportunities of giving the asafœtida in carious affections of the bones, and the event has been such, that I am very much inclined to believe, that the asafœtida is nearly as much a specific in the caries and necrosis, as the bark in the ague, and mercury in the lues venerea. Other remedies may occasionally be joined with the use of the asa-

* J. L. Schmucker *Heelkundige Mengelschriften*, ex. vers. expert. J. Daams, t. i, p. 151, & seq.

fœtida; for inſtance, in caries originating from the venereal diſeaſe, mercury ſhould be given at the ſame time; in ſcrofulous caſes, or where the ſtrength of the patient is very much reduced, the bark ought to be joined with it; when the patient ſuffers a great deal of pain and reſtleſſneſs, opiates are to be given in conjunction with the aſafœtida; and even though the ſymptoms of general irritation are not ſo violent, as to require the uſe of opium, yet it will be adviſable, in all caſes where the patients are either of a delicate conſtitution or of an irritable fibre, to combine opium with the aſafœtida, in order to moderate it's ſtimulating effects on the general habit. But this remedy does not agree with full plethoric temperaments, on account of it's operating too powerfully, before the patients are prepared for it's uſe by veneſection and the antiphlogiſtic plan.

As to external applications, a variety of theſe are propoſed by writers on the ſubject. The ancients, as ſoon as any bone was laid bare, immediately had recourſe to powders and tinctures of aloes, euphorbium, myrrh, and other ſtimulants. As it is evident, that the only effects, which applications of this kind are capable of producing, farther than that of correcting the ſmell, are to irritate and inflame the ſoft parts of the wound, without having the leaſt influence on the diſeaſed bone, this practice is at preſent pretty generally laid aſide. Others recommend in the necroſis the application of the actual cautery. This remedy, however, cannot fail of having pernicious effects; for, if the cautery be uſed in a ſparing manner, the diſeaſed part of the bone

bone will not be removed; and if, on the contrary, it be applied ſo as entirely to deſtroy the diſeaſed parts of the bone, the ſound parts underneath will become undoubtedly inflamed in conſequence of the ſtimulus of the heat applied, and will frequently be rendered carious likewiſe; in fine, by uſing the cautery you do not at all quicken the exfoliation, for though the affected parts of the bone be quite burned dead, ſtill the ſame time is requiſite for the ſeparation of the bone, as this cannot take place, before a vacuity is formed between the dead and living parts, by the abſorbents taking up the intermediate oſſeous particles. The actual cautery, therefore, never does any good, and is very likely often to do a great deal of miſchief. Others are very fond of making a number of ſmall perforations all over the ſurface of the diſeaſed bone; but the objections we have ſtated to the uſe of the cautery hold equally ſtrong with reſpect to theſe; ſince if the inſtrument penetrate into the ſound parts underneath, theſe muſt neceſſarily ſuffer materially; if it do not go ſo deep into the ſubſtance of the bone, as to touch the living parts, they certainly are of as little uſe, as ſcarifications would be in the gangrene of the ſoft parts. Profeſſor Weidmann of Mentz found, upon a large ſcale, that thoſe patients, in whom the buſineſs was left to nature, uſually recovered more quickly than thoſe, in whom the actual cautery or perforations had been employed. Indeed, inſtead of quickening the proceſs of exfoliation, theſe means often retard the natural exertion of the ſyſtem for the removal of the diſeaſe *. Some ſurgeons make uſe of a large pledget

* De *Necroſi Oſſium*.

of mercurial ointment. As it is not probable, that the mercury ſhould penetrate to the diſeaſed parts, this remedy cannot be attended with any good effects; but even taking it's action for granted, it would ſtill be a very queſtionable point, whether the advantage gained would be comparable to the injury done to the general habit by it's uſe. The only external application, from which I have ſeen any benefit, in carious ulcers, is lime water; and I believe, that the covering of the ulcer with lint dipped in it, and the applying of a roller in order to make a moderate equal preſſure, in all caſes anſwer the purpoſe better than any thing elſe.

A carious bone, at leaſt if the ulcer occupy any conſiderable extent, ſhould never be laid open before the diſeaſed parts looſen at their edges, in which caſe they may be taken away with the forceps; for if an extenſive bony ſurface be expoſed to the air for any conſiderable length of time, the parts underneath not unfrequently become affected with caries likewiſe, and the loſs of the limb is ſometimes the conſequence of ſuch a practice.

If the caries prove incurable, and the diſeaſed part be ſo ſituate as not to admit it's removal by amputation, the general habit becomes ſooner or later affected by the diſeaſed action of the affected part; the patient is extremely reduced in ſtrength, in conſequence of the continual irritation of the ſyſtem by the carious ulcer; and a hectic fever comes on, under which he gradually ſinks.

GENUS III.

Lues Venerea.

The venereal poiſon, in the ſame way as moſt other contagions, firſt produces a local complaint, which, when not remedied by the deſtruction of the poiſon, is at laſt taken up by the lymphatics, and produces the general infection. Sometimes the ſymptoms of confirmed lues are obſerved indeed, without the patient's previouſly experiencing any local complaint; theſe caſes, however, but rarely take place. The local diſorders brought on by the venereal poiſon are gonorrhœa, chancre, and bubo.

Gonorrhœa is the form, under which the diſorder moſt frequently appears, and is to be looked upon as an inflammation of the urethra, occaſioned by the ſpecific ſtimulus of the venereal virus. It is attended with a diſcharge of mucus from the orifice of the urethra; a pleaſing titillation of the glans; tenſion and redneſs of the penis; pain and ſcalding in micturition, and frequently bloody urine; an involuntary and painful erection, with an incurvation of the penis. The complaint, when left to nature, would in general wear itſelf out; but as this is tedious and uncertain, it is therefore better to put a ſtop to the diſorder by art, which uſually may be done in a ſhort time with ſafety to the patient.

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The cure consists in counteracting the venereal poison, and in keeping off the irritation of the system in general, and of the affected organ in particular. The venereal poison is best counteracted by injection of a dilute solution of the lapis causticus, a solution of the mercurius sublimatus corrosivus, or of the ærugo æris, or the aqua calcis. If, however, there be a great deal of pain and inflammation, such injections would be highly improper, and Goulard's water with the tincture of opium, or this tincture diluted with water, is to be used, in order to abate irritation; an opiate is to be given every night; the part is to be kept clean; the body is to be kept open by cooling and gentle laxatives; the scrotum is to be suspended; and leeches are to be applied to the part. Cold, and every thing capable of irritating the system, especially the affected part, are carefully to be guarded against. In cases where the fever and inflammation run very high, the penis is to be wrapped in fomentation of poppy heads; bleeding is to be prescribed, and the whole of the antiphlogistic regimen is to be adopted. By such treatment the gonorrhœa is in general easily and speedily remedied. If, however, the injections have not been sufficiently diluted, so as to give little or no pain; or if they were thrown up too far into the urethra; if the patient have imprudently exposed the affected organ to cold; if, from any neglect on the side of the patient, from improper treatment, or from any other cause, the inflammation of the urethra have been increased to a considerable degree; the consequence is, that the gonorrhœa suddenly stops, and some other organ becomes

becomes affected by ſympathy. Hence the hernia humoralis, iſchuria, and the acute ophthalmia, which are the chief complaints ariſing in conſequence of the gonorrhœa being ſtopped, ought to be explained.

The hernia humoralis, or the ſwelling of the teſticle is the moſt frequent ſymptom that follows the ſuppreſſion of the gonorrhœa. It is at preſent generally allowed, that the ſwelling of the teſticles is owing to their ſympathy with the urethra, and by no means to the venereal poiſon's being conveyed to them; as diſſection teaches us, that lymphatics going from the urethra to theſe organs do not exiſt. The complaint may be foreſeen by a violent rending pain in the lower part of the belly, gripings of the bowels, and retching. Soon after the patient feels ſevere pain along the whole courſe of the urethra, which is extended to the vas deferens, the epididymis, and the body of the teſticle itſelf; and there ariſes a ſwelling of theſe parts, which often acquire an enormous bulk. As this complaint is nothing but a ſympathetic inflammation of theſe parts, the beſt treatment conſiſts in abating the inflammation, which is moſt effectually done by keeping the ſcrotum ſuſpended, and the body open by gentle laxatives; by applying leeches, and cold fomentations of Goulard's water, to the part; by the uſe of opiate clyſters; and by giving opium by the mouth. The diet of the patients ought to be antiphlogiſtic, and ſometimes the drawing of a certain quantity of blood is neceſſary. By theſe means the complaint is very often effectually remedied. Frequently, however, the inflammation

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of the teſticle terminates in an induration and enlargement of that organ, which proves difficult and often impoſſible to be removed. The moſt powerful means of reducing the teſticle to it's natural ſize and ſoftneſs are a poppy fomentation, an oatmeal poultice, the cicuta and gum ammoniac, camphor and volatile liniment, and more particularly the introduction of a bougie into the urethra. If upon trial all theſe remedies ſhould unhappily be found incapable of accompliſhing the reſolution of the indurated teſticle; the patient may conſole himſelf with the reflection, that this induration of the teſticle never degenerates into the ſarcocele, is unattended with any danger, and does not in the leaſt interfere with the functions of the organ.

Another accident, that is now and then met with, is, that the ſwelled teſticle feels ſofter to the touch than natural, becomes gradually leſs and leſs, and is in time wholly abſorbed, ſo that nothing is left but a membranous bag. This is a very unpleaſant circumſtance, both for the patient and the practitioner, as the diſorder is beyond the power of phyſic. Fortunately this caſe ſeldom occurs.

Both the iſchuria, and the acute venereal ophthalmia, are likewiſe to be conſidered as ſympathetic complaints. The firſt is to be remedied by the application of leeches to the inſide of the thigh; by rubbing the volatile liniment with camphor into the region of the pubis and the perinæum; by bliſters; by applying a poppy fomentation to theſe parts; by clyſters, the warm bath, gentle laxatives, bleeding, and opium; by the introduction

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of a catheter; and laſtly by puncturing the bladder above the oſſa pubis. The other by the application of leeches, the tincture of opium, the ſcarification of the membrana conjunctiva, opiate clyſters, and the antiphlogiſtic regimen.

In treating of the cure of the gonorrhœa, and the complaints it often occaſions, I have not mentioned either the giving of mercury, or any other remedy uſed in the cure of the lues venerea: for, as the gonorrhœa is nothing but a local inflammation of the urethra, occaſioned by the ſpecific ſtimulus of the venereal poiſon, and as a ſpecific affinity between the venereal poiſon and the abſorbents is requiſite before it can be taken up into the ſyſtem; as, in fine, experience teaches us, that this affinity is very ſeldom produced without an ulcerated ſurface being previouſly induced by the poiſon; becauſe the original orifices of the lymphatics, on account of their inherent elective power, are much leſs liable to abſorb ſtimulating ſubſtances than their trunks; the natural inference muſt be, that the cure of a clap is to be performed by topical remedies, and the antiphlogiſtic regimen; and that the adminiſtration both of the preparations of mercury and of nitrous acid, in a word of all medicines for the purpoſe of deſtroying the venereal poiſon, is uſeleſs; as it is ſufficiently evident, that all medicines whatever muſt loſe their powers, before they can poſſibly reach the ſeat of the complaint. It has been a matter of diſpute, whether the virus of the gonorrhœa were really the ſame with that of the confirmed lues; but ſince, when the urethra is injured in gonorrhœa, either by an imprudent

prudent introduction of the catheter, or by any other cauſe, the lues is not an unfrequent conſequence; ſince beſides, it is well known, that ſound women, by having ſexual intercourſe with patients labouring under the gonorrhœa, often get chancres, and *vice verſa*; it is manifeſt, that the virulent gonorrhœa and the lues venerea are both effects of the ſame poiſon, and by no means of two different morbid matters.

When, after the cure of the gonorrhœa, a diſcharge from the urethra, called a gleet, remains, this, if it depend on a ſlight inflammation of the urethra kept up by the weakneſs of the organ, is to be cured by injections of a ſolution of alum, of the cuprum ammoniacale, of the vitriolum album, of the vitriolum cœruleum, or of the hydrargyrus muriatus. Sometimes, when all theſe remedies have been tried in vain, the complaint has been found to originate from a ſtricture in the urethra, and has been removed by uſing bougies. Now and then, however, the gleet does not yield to any remedy, and after every thing has been given without ſucceſs, it at laſt wears itſelf out in time.

The venereal poiſon, eſpecially when applied to parts covered but with a thin cuticle, operates with ſuch violence, as to produce ulceration. The venereal ulcers, or chancres, firſt appear in the form of a ſomewhat purpliſh red ſpot. This changes into ſeveral ſmall puſtules, which, running together, form a deep, large ulcer, narrow and contracted at the bottom, with white, ragged, and ſomewhat callous edges; and the circumference looks red and inflamed, to a conſiderable diſtance beyond the ſore.

ſore. As in theſe caſes, on account of the ulcerated ſurface, the danger that the ſyſtem will become infected by the poiſon is always very great, the moſt effectual method of treating the chancres is to touch it with ſome ſtrong cauſtic; for by this all the venereal matter being deſtroyed at once, the ulcer is reduced to the ſtate of a ſimple purulent ſore. It is true, indeed, that practitioners are frequently not called in till after ſome time, and till the different ulcerations are conſiderably enlarged: but, as the abſorption of the poiſon often does not happen till ſome days have elapſed, even from an ulcerated ſurface; as experience has taught me, that patients labouring under chancres may in general be cured by topical applications, without their afterwards experiencing the leaſt ſymptom of the diſorder; and as this fact is likewiſe confirmed by the practice of other phyſicians *; as long as the ſymptoms of the confirmed lues do not make their appearance, we ought to treat the chancre as a local complaint; and in caſes, in which, on account of the extent of the ulceration and the tender ſtructure of the parts, it might ſometimes be dangerous to apply the more active cauſtics, the waſhing of the part with lime-water, and the dreſſing of the ſore either with the mercurius præcipitatus ruber, or with lint dipped in a ſtrong ſolution of the argentum nitratum, ſeveral times a day, are to be adopted; by means of which the chancre will ſoon be reduced to the ſtate of a ſimple ulcer, and the progreſs of the infection will frequently be prevented.

* *Aſtruc, de Morbis venereis*, t. i, p. 536: and *Girtanner*, l. 1. zweites buch, 1 theil, ſeite 212.

Phymoſis,

Phymoſis, paraphymoſis, and warts, often attend chancres. In the phymoſis the conſtricted prepuce is to be relaxed by the uſe of warm milk, emollient poultices, or Goulard's water combined with laudanum; the aqua calcis is to be injected ſeveral times a day between the prepuce and the glans, in order to prevent coheſion; and topical and general bleeding are occaſionally to be uſed. When theſe means have been tried in vain, and chancres are confined under the prepuce, it becomes neceſſary to remove the ſtricture, by an inciſion carried along the whole extent of the preputium. In the paraphymoſis, if the prepuce cannot be brought forwards over the glans by a gentle attempt of the ſurgeon, cold ſaturnine applications, bleeding, and a low diet, are to be tried. But if theſe remedies be found ineffectual to abate the ſwelling of the glans, and to remove the ſtricture of the prepuce; in order to prevent a mortification of the glans from coming on, a complete removal of the ſtricture is to be accompliſhed by the operation, which is performed by making a deep ſcarification of about half an inch in length on each ſide of the penis, directly behind the glans. As to the warts, if they be of any ſize, the taking them away with a pair of ſciſſars beſt anſwers the purpoſe. When they are but ſmall, touching them with cauſtic, or the application of the pulvis ſabinæ, proves the beſt mean of removing them.

The third main primary ſymptom of the lues venerea is a ſwelling in the groin, or a bubo. The bubo is for the moſt part a ſympathetic affection ariſing from gonorrhœa or chancre. Sometimes, however,

however, it is the conſequence of the venereal matter being conveyed to the gland by the lymphatics. In the commencement of the complaint, it is often impoſſible to diſtinguiſh the idiopathic bubo from the ſympathetic; but, indeed, it ſeems to be a matter of little importance to know whether it be idiopathic or ſympathetic; for in all caſes, as long as the patient ſhows no ſymptoms of the confirmed lues, the bubo is to be conſidered as a local inflammation of a lymphatic gland, the reſolution of which is to be accompliſhed by emetics; the application of leeches, in caſes where there is much inflammation; the cold ſolution of Schmucker, conſiſting of ſal ammoniac, nitre, vinegar, and water; and the rubbing of the inſide of the thigh frequently with the volatile liniment and camphor; by which means, when employed in an early ſtage of the diſorder, the bubo may almoſt always be reſolved. If, however, after three days, the bubo, inſtead of going back, be found ſtill to increaſe in bulk, all attempts to effect a reſolution ought to be laid aſide, and ſuppuration is to be promoted by the application of warm poultices to the part: which ſometimes ought even to be of a ſtimulant nature in weak perſons, to whom, both to promote the ſuppuration, and during the courſe of it, the bark and wine are to be given. As to the opening of the abſceſs, this is beſt left to nature, by which all the inconveniences that often attend an artificial opening are prevented.

It will doubtleſs be deemed reprehenſible by ſome practitioners, that, contrary to the general cuſtom, I do not adviſe the exhibition of mercury, either in the chancre or the bubo, till the ſymptoms

of the confirmed lues are coming on; but, as experience proves, that chancres, for the moſt part, may be cured by topical means alone, without the leaſt ſymptoms of the lues afterwards appearing; and that the idiopathic and ſympathetic buboes are not always to be diſtinguiſhed at the commencement; it ſeems to be highly improper to weaken the ſyſtem by the exhibition of mercury, previous to the ſymptoms of the confirmed lues making their appearance. More eſpecially as this preſervative cure, as it is called, is of no uſe at all in preventing the ſecondary ſymptoms; for, as the late John Hunter juſtly obſerves, mercury does not deſtroy the diſpoſition of the body to contract the lues. Indeed if this were the caſe, to prevent the lues the taking of mercury would be ſufficient. Experience, however, ſhows the contrary; for it ſometimes happens, that when patients have been even ſalivated for the cure of chancre and bubo, ſtill after ſome time they find the ſymptoms of the confirmed lues coming upon them. It is ſaid, that in theſe caſes the venereal poiſon has infected the conſtitution ſo much, that one mercurial courſe was not capable of performing a radical cure: but the fact is, that mercury does not deſtroy the ſuſceptibility of the ſyſtem for the poiſon, any more than any other ſpecific; it only takes away the noxious effects upon the ſyſtem by putting a ſtop to it's action. It follows, therefore, that mercury, given before the ſymptoms of the lues appear, can have no other effect than that of hurting the conſtitution. As, however, the prejudices of people are very great, it will be moſt prudent, along with the external remedies, to exhibit ſmall doſes of mercury, ſo as to operate as an alterative,

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in order to ſatisfy the mind of the patient; which exhibition of mercury, though probably it is of no uſe at all, cannot materially injure the conſtitution.

If the venereal virus be not deſtroyed at the ſpot, at length the requiſite affinity being produced between the poiſon and the inflamed abſorbent veſſels, it is taken up by the lymphatics, and conveyed to the blood, ſo that the whole conſtitution becomes infected. The poiſon, however, more eſpecially affects the abſorbent ſyſtem and the ſecerning veſſels. The morbid matter is depoſited by metaſtaſis on different parts of the body. It attacks the palate, the throat, and the noſe, with an inflammation, terminating in an ulcerating proceſs. The ulcers, which ſecern a fetid matter, are deeply ſeated, ſpread, and waſte the neighbouring parts. Various bones, eſpecially the more tender ones, ſuch as thoſe of the palate, the ears, and the noſe, become carious, and drop out; hence deglutition, ſmelling, hearing, and ſpeaking, become difficult. The patient complains of head-ache, and of univerſal pains in the bones, eſpecially about the middle of the tibia; which pains are exaſperated at night. Different extuberances of the bone take place. The bones become fragile, and ſometimes ſoft and flexible. The ſkin is often covered with broad ſpots of a brown or copper-colour, afterwards turning red, and at length cruſtaceous, attended with itching, and ulcers breaking out in ſeveral places. All theſe ſymptoms daily increaſe, and a hectic fever ſoon comes on; produced not by the abſorption of the venereal matter, for this poiſon has been taken up a long time before, but by the con-

tinually irritating noxious ſtimulus, by which the ſolids grow every day more and more weakened and degenerated, till at laſt their tone being totally deſtroyed, death enſues, ſo that life is extinguiſhed by ſlow degrees, ſomewhat in the ſame manner as in the phthiſis. Nay, ſometimes thoſe who are deſtroyed by the lues die of a real pulmonary conſumption; when either the preparations of mercury, particularly the hydrargyrus muriatus, are imprudently uſed, or the lungs of the patient are naturally weak. Theſe caſes nevertheleſs but rarely occur. Bennet, that accurate obſerver of conſumptions, had in his practice ſeen only two inſtances, and I have myſelf obſerved the venereal phthiſis only once: ſo that this poiſon does not ſeem to affect the lungs except by accident.

The prognoſis of the confirmed lues is to be taken from the degree of the diſorder, and the conſtitution of the patient; for though in ſound bodies, in the commencement of the diſeaſe, when properly treated, it is not dangerous, yet when the malady is very far advanced, when it attacks weak perſons, or the conſtitution of the patient is hurt by ſalivation, it often carries off thoſe who labour under it. Theſe circumſtances, therefore, ought carefully to be attended to in the prognoſis.

With reſpect to the cure, mercury is the chief antidote we poſſeſs. This is to be introduced into the ſyſtem either by friction, or by giving it internally. The internal exhibition of mercury I prefer to the rubbing it in, for the following reaſons. 1. In the latter method it is impoſſible to know

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the quantity of mercury abſorbed, and it is thus always to be feared, that we may adminiſter either too little or too much. 2. Such treatment cannot be purſued in irritable perſons of a delicate frame, or labouring under any complaint of the lungs: for as thus a large portion of mercury is at once conveyed into the ſyſtem, the conſtitution is very much hurt by the unuſual ſtimulus; convulſive ſymptoms, and even epilepſy are not unfrequently produced by it; the nervous ſyſtem is always greatly injured, and, if the patient be weak, mortification of the part affected, and death itſelf are often the conſequences. Beſide this quick introduction of a large doſe of mercury into the ſyſtem by friction, in order to promote ſalivation, not only does not promote the cure of the diſeaſe, but often proves worſe than the complaint itſelf, by the ſudden ſhock it communicates to the conſtitution. Indeed I have frequently ſeen patients deſtroyed by the weakening of the ſyſtem, and convulſive fits brought on by their going through what is commonly called a mercurial courſe, whoſe lives in all probability might have been ſaved, if the mercury had been adminiſtered in a more ſlow and gradual manner. Salivation does not in the leaſt contribute to the cure of the complaint, and always extremely weakens the conſtitution. I have ſeen patients who had undergone ſalivation three times, and who had been continually ſpitting during ſix months, yet, notwithſtanding, the action of the venereal poiſon on the body was ſtill going on. It is indeed an erroneous practice to judge of the effect of mercury againſt the venereal poiſon by the degree of ſalivation which it produces: for

while in ſome perſons all the complaints will diſappear without ſcarcely any ſpitting at all, in others the ſalivation will come on in a few days from the exhibition of mercury, and continue during ſeveral days without the diſorder's being diminiſhed. Some perſons do not ſeem to be affected by the rubbing in, till, after ſome days, a ſudden proſtration of ſtrength comes on, attended with febrile commotions and night-ſweats; and the phyſician cannot but with difficulty, by the exhibition of bark and opium, prevent the diſorder from proving fatal. Salivation is alſo a very uncertain method of curing the lues: for, to cure the venereal complaint, the introduction of a ſufficient quantity of mercury is not enough; it is likewiſe requiſite, that this remedy ſhould remain in the ſyſtem during a certain period, in order to deſtroy the action of the poiſon. Now when the mercury is introduced into the ſyſtem in a large quantity at one time, it is quickly expelled the body by the different excretory organs, on account of the violent ſtimulus; whereas, adminiſtered in a ſlow and gradual manner, the mercury is retained much longer in the conſtitution. This ſeems to explain what I have ſeveral times ſeen, that perſons, who had gone through two or three mercurial courſes in vain, have been cured by the treatment I am now about to recommend; which is the making uſe of the mercurius dulcis, the mercurius precipitatus cinereus, and the hydrargyrus muriatus. But I would ſeldom recommend the adminiſtering of the mercury alone; as in general it is beſt to give a decoction of the bark, and opium, along with it; and by taking this precaution, even the hydrargyrus muriatus becomes a ſafe remedy, except in perſons of a delicate conſtitution, and

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weak lungs. In cases, where the patient wishes to conceal the complaint he labours under, the exhibition of mercury, opium, and the extract of the bark, in the form of pills, is the most convenient. By giving the bark and opium along with the mercury, the dreadful effects, which this remedy often produces upon the constitution, are effectually prevented, and the gripings, diarrhœa, and other disorders of the *primæ viæ*, of which the internal exhibition of mercury in irritable persons is frequently productive, are likewise obviated. The bark and opium seem to give to the mercury an additional efficacy against the venereal poison; at least I have found these remedies effectual in cases, in which the patients had gone through mercurial courses, and had used the nitrous acid, and the whole class of the oxygenates in vain. Though it is not to be denied, but that the radical cure of such patients even by the means here spoken of, is often difficult, on account of the long continuance of the disorder, and the reduced strength of the patient. It ought likewise to be observed, that, in order to accomplish a radical cure, these remedies are not to be desisted from immediately after the disappearance of the symptoms; but ought to be persevered in at least a fortnight or three weeks longer.

With respect to the quantity of mercury requisite for the cure of the disease, this admits of a considerable difference, according to the various constitutions of the patients. However, as we are not capable of determining beforehand the susceptibility of the system for the action of the mercury, it may be laid down as a general rule, to begin with

ſmall doſes, and afterwards, when it is found, that the diſeaſe does not yield to their uſe, to increaſe the doſe by degrees. During the uſe of mercury, a moderate quantity of wine may be allowed, and the uſe of animal food, which, far from doing miſchief, is advantageous in ſupporting the conſtitution.

Several other remedies beſide mercury have been recommended for the cure of the venereal diſeaſe. Of theſe the aſtragalus exſcapus, and the nitrous acid, deſerve to be noticed. From the decoction of the former I have obſerved much benefit, for the removing of exoſtoſis, and different affections of the ſkin, obſtinate even to mercury. The nitrous acid I have ſeen given with ſucceſs in ſeveral inſtances of the venereal ſore-throat, exoſtoſis, and different cutaneous affections, and often bring a ſpeedy relief of the complaint. In other caſes however I have ſeen it tried without the leaſt benefit, and ſometimes with miſchievous effects. I never ſaw a radical cure of the confirmed lues produced by it, where it was certain, that the patient had uſed no mercury before. Some, after having been apparently cured, returned at the expiration of ſome weeks with the complaint upon them. I am therefore perfectly ſatisfied, that it is a powerful auxiliary, but by no means to be depended upon alone for curing the confirmed lues. The mezereon, guaiacum, nux juglans, ſarſaparilla, and the warm bath, have likewiſe been found occaſionally to aſſiſt mercury in removing the diſeaſe.

As to the *modus operandi* of mercury in the venereal diſeaſe, the pneumatic phyſicians are of opinion,

nion, that the effects of the venereal poiſon conſiſts in the diminution of irritability, or in the want of oxygen; and that the diſeaſe is cured by the decompoſition of the mercurial calx in the human body, ſo that, the quickſilver being expelled the body by the different emunctories, the diſengaged oxygen reſtores the requiſite tone to the ſyſtem by it's ſtimulating power. For, ſay they, the preparations of mercury muſt operate in the lues by the reſolution of it's principles, becauſe this diſeaſe is likewiſe cured by the adminiſtration of the nitrous acid, the oxygenated muriatic acid, the citric acid, and the oxygenated muriate of potaſh: conſequently the effects produced in common by theſe remedies muſt be owing to the diſengagement of oxygen, their radicals being all poſſeſſed of different powers. But this argument will be found totally groundleſs, if we obſerve, that, except the nitrous acid, none of them have ever been given except in chancre and bubo alone, which, as we have already ſhown, being local complaints, are not to be cured by the exhibition of internal medicines, but by the application of topical remedies: and that even the nitrous acid, though enjoying a much greater quantity of oxygen, yet is found much inferiour to mercury in the cure of the confirmed lues. Beſides, taking it for granted, that the above medicines all enjoy an antivenereal power, ſtill, if we conſider the different doſes, in which they are uſed, and the different effects produced by them upon the conſtitution, it will appear, that they by no means operate by the diſengagement of their oxygen. For the nitrous acid is given from one to five drachms in the ſpace of twenty-four hours; the oxygenated muriatic acid, from a

ſcruple

ſcruple to four drachms; the citric acid, from three ounces to eight; and the oxygenated muriate of potaſh, from twelve grains to about a drachm. Now if theſe medicines operate only by the diſengagement of their oxygen, how is it to be accounted for, that the quantity of the oxygenated muriatic acid requiſite to the cure ſurpaſſes four times the doſe of the oxygenated muriate of potaſh, as it is a fact, that the latter by no means poſſeſſes a larger quantity of oxygen than the former? How can a drachm of oxygenated muriate of potaſh poſſibly afford to the ſyſtem the ſame quantity of oxygen as eight ounces of the citric acid? We find no leſs difference with regard to their effects upon the conſtitution. The quantity of mercury requiſite to cure the venereal diſeaſe, when adminiſtered in the uſual way, weakens the body, eſpecially the nervous ſyſtem, affects the teeth, gums, and mouth, and often produces ſalivation. The nitrous acid occaſions coſtiveneſs, and gripings of the bowels, ſtrengthens the *primæ viæ*, proves a powerful tonic for the whole ſyſtem, and by it's ſtimulating quality it now and then even induces an inflammation. The oxygenated muriatic acid cauſes great thirſt, a white tongue, a quick pulſe, and an inflammatory ſtate of the blood. The citric acid improves the appetite, and promotes the ſecretion of urine. The oxygenated muriate of potaſh produces a white tongue, and a greater inclination than uſual to drink; but the pulſe is natural, and there is no ſenſible increaſe of heat on the ſkin*. As there-

* See Dr. Rollo's *Account of two Caſes of the Diabetes mellitus*, vol. ii, p. 163, 168, 174, 189, & 194.

fore

fore these medicines produce quite different effects upon the constitution, supposing that they all really enjoy the faculty of counteracting the venereal poison, the natural inference must be, that their *modus operandi* does not depend upon their common principle, or upon the disengagement of oxygen.

Farther, if we inquire a little more accurately both into the symptoms of the lues venerea, and the *modus operandi* of mercury on the human body, no doubt will remain, but this opinion is quite contrary to the observations of nature. Indeed are a gonorrhœa, bubo, hernia humoralis, and the venereal inflammation of the eyes, signs of a diminished irritability? How can the pain and exostosis of the bones possibly be explained from the want of oxygen? If the preparations of mercury excite the vital powers by supplying oxygen, why do they prove hurtful in putrid diseases? Does the mercury operate in the inflammations of the liver by imparting fresh oxygen to the system? Are the vital principle and the tone of the body increased in those, who have made use of mercury during a long time? Can the hemoptysis, which not unfrequently follows the abuse of mercury, be accounted for from excess of the vital powers? I need not to mention the improbability, that any remedy should operate by a mere chemical resolution of it's component parts in a living body, in which, as I have above shown, strictly speaking, no chemical action can take place. These instances are wholly sufficient to prove, under how many difficulties this theory labours. It seems to me probable, that, as the bark does not prevent the approaching ague, but

but removes the febrile character when the diſeaſe is produced, ſo likewiſe mercury does not prevent the lues venerea, but the venereal diſeaſe being communicated to the ſyſtem, it deſtroys the diſpoſition impreſſed by the poiſon on the lymphatics continually to convert the fluid they contain into a matter of a peculiar kind partaking of the venereal character and expels the poiſon from the body by means of the vital principle.

GENUS IV.

The Leproſy.

Perhaps I rank this diſeaſe improperly: however, as ulcers always precede the hectic fever accompanying it, I think it agrees beſt with this order.

The nature of the leproſy is involved in great obſcurity. It is almoſt a ſtranger now in the temperate regions of the globe: yet, though it ſeldom occurs, as it in general proves fatal when it takes place, and as it is frequent in the european colonies, I ſhall give a brief deſcription of this horrible malady, as I find it in it's beſt commentators; and I ſhall explain, as far as I can, it's mode of operating.

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The firſt ſymptom of the leproſy is a change in the colour of the ſkin, in the part of the body in which the complaint breaks out, accompanied with inſenſibility in the affected part. It appears indifferently in all parts of the body, but never manifeſts itſelf in any part without at the ſame time affecting one of the three following; the parts covered with hair in the axilla, the region of the pubes, and the buttocks where the muſcles are covered with a great quantity of fat *. On the laſt of theſe it is moſt common. The ſpot is firſt of a pale or white colour, growing afterwards yellow, livid, or red. This ſpot ſlowly increaſes, and the malady then ſhows itſelf on other parts. A horrible deformity of the face is produced; the cheeks grow red, and, by degrees, blue and livid; the wrinkles of the forehead become leonine; the ſight fixed; the eyes round; the noſtrils fetid, thick, and inwardly obſtructed; the lobes of the ears thicken; and the ſkin puts on the appearance of that of an elephant, unctious, rough, ſquamous, wrinkled, rimoſe, and deſtitute of hair. The leprous ſpots break out all over the body, from the face to the ſoles of the feet, and, changing into tubercles, occaſion ſurpriſing deformity. The whole of the integuments of the body tumefy and indurate, and the perſpiration is almoſt entirely ſuppreſſed. The patient becomes melancholy, tired of life, and very ſalacious. The tubercles change into deep, putrid, and phagedenic ulcers. The bones, eſpecially of the noſe and fingers, grow carious, and drop off. Glandulous tumours ſome-

* G. G. Schilling, *de Lepra Commentationes.*

times

times arise. The blood drawn from a vein appears dissolved; the voice becomes hoarse and nasal; the breathing difficult and fetid; and the hair falls off. A hectic fever comes on; and at length wished-for death puts an end to the tragedy*.

This disorder is contagious, and descends from parents to children. Nay it is commonly believed, that it can be propagated to the fourth generation†. In those who are predisposed to this malady, it is either excited, or, when already existing, augmented, by a bad irregular diet, especially by living upon half rotten flesh or fish, and by the use of impure water.

The prognosis of the leprosy is very ominous; Callisen and Joannis pronounce the malady incurable; Schilling, however, who had frequent opportunities of seeing this disease in all it's forms, observes, that it can be cured in it's commencement, but that no remedy is capable of vanquishing it, when inveterate‡. He accomplished the cure chiefly by means of aperients, purgatives, tepid baths, diaphoretics, and bitters; and he observed, that all the preparations of mercury were extremely hurtful. As to the proximate cause of this disease, Schilling is of opinion, that it is the too great viscidity of the lymph, arising from a thick blood,

* Schilling, l. l.: Callisen, l. l. t. i, p. 368: and *Med. Obs. and Inq.* vol. i, art. xviii, p. 201.

† Schilling, l. l. § xxx, et seq.: et *Med. Obs. and Inq.* l. l. p. 204.

‡ L. l. p. 36 et seq

and

and the conſequent want of perſpiration*: but this opinion is quite contradictory both to the ſymptoms of the diſorder, and to the doctor's own obſervations. It is by no means eaſy, however, in ſo obſcure a ſubject, to ſubſtitute in the place of this theory one more conſiſtent with the phenomena obſerved: yet, as far as can be concluded from the ſymptoms of the diſtemper, it ſeems to me to be highly probable, that the leprous character is impreſſed on the children from the parents; that is, that ſuch a diſpoſition of the ſolids is communicated to their very tender bodies, as renders them liable to be infected with the leproſy at the approach of a proper exciting cauſe. This opinion is confirmed by this; that, according to the teſtimony of Dr. Schilling, "children born of "leprous parents often incur no diſorder, but grow "up healthy and vigorous till the age of puberty, "when the leproſy ſuddenly manifeſts itſelf†;" an evident token, that the diſorder itſelf is by no means communicated, but the prediſpoſition to it alone. Moreover, Dr. Schilling himſelf in another place ſeems to be of my opinion; for he ſays, "if "children, whoſe parents labour under this diſ-"temper, be committed to the care of healthy "nurſes, and ſent to a ſalubrious and colder "air, they often remain free from this diſeaſe, "though they have it's prediſpoſition in them, "which ſometimes breaks out after many years, "when they return into their native hot country‡."

* L. 1. p. 29. † Ibid. ‡ L. 1. p. 38.

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In the ſame way this diſorder is communicated to a ſound perſon by infection; for then alſo the leproſy itſelf ſeems not to be brought on, but only the prediſpoſition to it impreſſed on the patient. And this ſeems to explain, why, notwithſtanding this diſorder is infectious, women, when healthy, and regular in their diet and manner of life, may not only often live with their leprous huſbands for a long time without any apparent marks of their being infected*; but ſeveral even remain entirely free from the leproſy†; for, though the leprous character is communicated to the wife by the huſband, nevertheleſs the prediſpoſed ſolids are prevented from producing the leproſy by a proper regimen and way of life. If however any exciting cauſe ſupervene, the prediſpoſed ſolids are induced to take on certain actions, the conſequence of which is the ſecretion of poiſonous matter of a peculiar kind, partaking of the leprous character. In this caſe when the patient is ſtrong and vigorous, nature alone ſometimes vanquiſhes the diſtemper, and then this ſecerned matter, is ſeparated from the maſs of fluids, and carried to the ſurface of the body, where, being changed into cruſts, it falls off in ſcales. That this happy event is ſometimes obſerved in the leproſy, was well known even to the famous legiſlator of the jews, Moſes, who, having forbidden to the iſraelites the uſe of ſuch meats as in a hot climate may produce this diſorder in the prediſpoſed, afterwards giving laws on the leproſy itſelf, ſays, " And if a leproſy

* Schilling, l. l. p. 34.

† *Medic. Obſ. and Inq.* l. l. p. 204.

" break

" break out abroad in the ſkin, and the leproſy
" cover all the ſkin of *him that hath* the plague
" from his head even to his foot, whereſoever the
" prieſt looketh.

" Then the prieſt ſhall conſider: and behold,
" if the leproſy have covered all his fleſh, he ſhall
" pronounce *him* clean *that hath* the plague: it is
" all turned white: he is clean*.

Thus this *divine* man had perceived, that, in ſuch caſes, the leprous matter being depoſited by a happy criſis at the ſurface, and there formed into cruſts by the ſecerning veſſels, the diſorder is removed.

The vital powers however are, for the moſt part, unable to vanquiſh this diſtemper; yet they continually reſiſt it, and by their reaction the morbid matter is, in great part, carried by *metaſtaſis* to ſome part of the body, which, being ſoon totally altered by the leprous ſtimulus, exhibits the common ſymptoms of this diſeaſe, the reſt of the body ſtill remaining in a tolerably healthy ſtate. As a proof of this, all the ſecretions are almoſt naturally performed in the beginning of the diſorder, except that of urine alone, which in the commencement of the leproſy is pale, and reſembles in ſmell the pickle, in which herrings are preſerved†. And in farther confirmation of it, if the afflicted part be extirpated at ſome diſtance, the other parts appear in a natural ſtate: which is no way ſurpriſing,

* *Lev.* chap. xiii, ver. 12 and 13.

† Schilling l. l. p. 16 & 19.

ſince the remaining portion of contagious matter is then too ſmall for it's effects to appear in the reſt of the body; ſo that by a proper diet, and manner of life, ſuch patients may often live in a pretty healthy condition even for twenty years. But if, indulging their inclinations, they neglect the dietetic rules, this remaining matter, reanimated, as it were, by the acceſs of a noxious ſtimulus, operates much more violently on the ſolids; which, already weakened by the former ſtruggle, are unable to reſiſt this renewed attack; and, being continually ſtimulated by the poiſonous ſtimulus, entirely degenerate; the fecerned humours become vitiated, and intolerably offenſive; and a hectic fever ariſes, ſoon ending in death*.

I do not venture to aſſert, however, that the manner of dying of leprous patients perfectly agrees with that of the tabid, and the phthiſical; for Dr. Joannis ſays, that a woman, whoſe huſband had died of the leproſy, informed him, that her huſband was more diſpoſed to venery after having contracted this complaint than in the vigour of his health; and even that he had had ſexual intercourſe with her more than once with the utmoſt ardour within twenty-four hours of his death†; but I greatly doubt, whether this would have been the caſe with any labouring under either tabes or phthiſis.

* Schilling *l.* l. p. 16.

† *Med. Obſ. and Inq.* l. l. p. 208.

ORDER

ORDER II.

Atrophies.

GENUS I.

Tabes.

The tabes is a general waſting of the whole body, but uſually without any cough or expectoration.

As this diſtemper is produced as often, as the body, not being properly nouriſhed, or being violently ſtimulated, becomes weakened and emaciated; it appears, that it may be engendered by a great variety of cauſes. Whatever impedes the act of ſwallowing, prevents the deſcent of the food ſwallowed to the ſtomach, impairs the action of the ſtomach and inteſtines on the food taken, injures the abſorbent, ſanguiferous, or ſecerning ſyſtem, produces an alteration of the ſtructure of the bowels, or preternaturally ſtimulates the body, may, under certain circumſtances, occaſion tabes; though, in my humble opinion, all the cauſes of this diſorder, with reſpect to their manner of operating, may be reduced to the four following ſpecies:

1, Thoſe, which bring on tabes by the depraved manner of acting of the lymphatic or ſanguiferous ſyſtem. This is the caſe in all thoſe commonly called ſecondary phthiſical conſumptions, ſuch as the ſcrofulous, the rickety, the ſcorbutic, the venereal, &c. This tabes, being always a ſymptom

of another diſeaſe, may be juſtly called ſympto-matic.

2, Thoſe, which occaſion this diſtemper by the vitiated action of ſome organ; to which ſpecies all the various affections of the viſcera (obſtructions), depraved ſecretions, deſtroyed tone of the alimentary canal, &c., belong.

3, The degeneracy of the organical compoſition of ſome organ, the function of which is requiſite to life. Theſe caſes are not unfrequent, as may be inferred from the following inſtances. Tulpius has obſerved a hard tumour between the œſophagus, and the windpipe, firſt ſtraitening, and afterwards totally cloſing the upper part of the œſophagus, ſo that, the paſſage of the food being impeded, the perſon died of hunger*. Van Geuns and Nahuys, relate many ſuch caſes †. Francis Pringle mentions a caſe of a man killed by tabes, in whoſe body a hard glandulous tumour was found, which exactly filled up the whole cavity from the middle of the œſophagus to the mouth of the ſtomach, ſo that a probe could ſcarcely be introduced into the ſtomach ‡. Dr. Taylor has obſerved a ſcirrhous tumour occupying the ſuperiour part of the ſtomach ‖. Dr. Simpſon has found, in a woman who died in conſequence of the paſſage of food to the ſtomach being impeded, the œſophagus cartilagin-

* L. l. lib. i, cap. xliv, p. 28.

† *Hollandſche Maatſchappy*, etc., ii deel.

‡ *Med. Eſſays and Obſ.* Vol. ii, Art. xxiv, p. 277.

‖ *Med. Eſſays and Obſ.* l. l. p. 278.

ous

ous almoſt through it's whole length from the clavicles to the ſtomach, and ſo narrow, that it ſcarcely tranſmitted a briſtle *. Triller ſaw a fatal hunger occaſioned by a callous narrowneſs of the mouth of the ſtomach †. Haller and Ruyſch have ſeen the ſtomach afflicted with a ſcirrhus ‡. Stoll has found the pylorus narrow, harder than uſual, and ſcarcely admitting a quill ‖. Tiſſot has ſeen the liver totally ſcirrhous §. Haller mentions a ſcirrhus of the cawl ¶. Morgagni and Walter have found the glands of the meſentery enlarged, indurated, almoſt changed into a ſtony ſubſtance, and filled up with a kind of cretaceous matter **, which, upon examination, was found to be phoſphate of lime.

4, Morbid ſtimuli, which, by continually irritating the ſyſtem, produce a hectic fever and conſumption in an otherwiſe ſound body.

The prognoſis of the tabes is, in general, ominous. In the firſt ſpecies, or in the ſympto-

* *Mémoires de l'Académie Royale de Chirurgie*, t. i, p. 489, edit. in 4to.

† L. l. vol. i, diſſ. i.

‡ Haller *Opuſ. pathol.* obſ. xxi, p. 44, and Ruyſch *Oper. omn. anat. med. chirurg.* vol. i, obſ. xxxix, p. 38.

‖ *Rat. Med.* pt. 3, ſect. v, p. 276.

§ *Epiſt. ad Zimmermannum*, obſ. 3, p. 26.

¶ L. l. *obſ.* xxv, p. 49.

** Morgagni *de Sed.* et *Cauſ. Morb.* vol. ii, lib. ii, epiſt. xxxix, art. vi, p. 317 & 318: et *Walter Von der Einſaugung, und der Durchkreuſung der Sehnerven*, § 51.

matical tabes, the danger of death is greater or leſs, according to the various diſeaſes, and their different ſtate. In the ſecond, if the tabes ariſe either from the various affections of the viſcera (obſtructions,) or from the deſtroyed tone of the alimentary canal, it can in general be cured in it's commencement; though ſometimes, eſpecially when it happens to perſons addicted to drinking and venery, this ſpecies proves mortal. The third ſpecies is abſolutely incurable, and always ſooner or later kills: nay this ſpecies of the tabes is of ſo melancholy a nature, that frequently the phyſician cannot even palliate the complaint, eſpecially when the paſſage of the food toward the bowels is precluded by an alteration in the ſtructure of the œſophagus or ſtomach. It is a miſerable ſpectacle to ſee, how the imperious hunger at once nauſeates and longs for meat, drink, and the delicacies of life; and how the ſufferers, no longer capable of ſwallowing the leaſt morſel of food, their ſtrength being totally exhauſted by long faſting, at length expire in the higheſt degree tabid.

Thus thoſe are carried off by tabes, whoſe *primæ viæ* become impervious. That a ſound perſon, however, from whom all food ſhould be withheld, would likewiſe always die tabid, is what I do not venture to aſſert: on the contrary it ſeems to me, that in ſuch caſes the manner of dying would not be certain, but would differ in different ſubjects; yet, that moſt of thoſe, from whom all food ſhould be withheld, would be killed, while ſtill tolerably fleſhy, by convulſions *. Though, if ſuch perſons were either of a more advanced age, or if food

* Morgagni, l. l. t. ii, lib. iii, epiſt. xxviii, art. v and vi: and Haller, *Obſ. pathol.* obſ. xxiv, p. 48 & 49.

alone

alone were withheld, and not drink, life would often be protracted for a long time, and, at laſt, they would, for the moſt part, die tabid *. I ſay, for the moſt part, as there are exceptions to this rule: for the celebrated Voltelen relates, that a woman, who had lived on drink alone during ſeven years, retained conſiderable vigour, and would have protracted life longer, if ſhe had not been carried off by a putrid fever †.

In fine, the fourth ſpecies, when occaſioned by worms, is often ſoon cured, on their being diſcharged; whereas, if the tabes be produced by calculi, the prognoſis is ominous, and the diſeaſe moſtly terminates in death.

I am obliged to be ſilent on the cure of this diſeaſe, becauſe it is abſolutely impoſſible to lay down general rules for curing a diſtemper, which ariſes from ſo many, and ſuch different ſources. Beſides I occaſionally take notice of the cure of this complaint, when treating of the ſeveral diſorders, of which it is an attendant.

GENUS II.

Jaundice.

JAUNDICE may be defined to be a change of the natural colour of the human body into a yellow, ſometimes green, and even blackiſh hue.

* Ruyſch, l. 1. t. i, *obſ.* lxviii, p. 64: *Bonnetus, Sepulchr. anat.* t. ii, lib. 3, ſect. ii, obſ. 18, p. 21: and Voltelen *Diatribe Medica memorabilem Septennis apoſtiæ Hiſtoriam exhibens*, cap. vi, p. 118.

† Voltelen *ibidem*, capita quinque priora.

This diſorder is moſtly attended with torpor and laſſitude; with a ſenſe of weight, fulneſs, and pain, at the region of the ſtomach, and in the right hypochondrium, coſtiveneſs; impaired appetite; fæces of a light clayey appearance; urine thicker than uſual, and tinging linen of a yellow colour.

As the theory of almoſt every diſeaſe has been hitherto founded either on obſtructions, or acrimonies, ſo phyſicians, attempting to determine the proximate cauſe of the jaundice, have ſtated, that it is an impeded flow of the bile from the gall-bladder to the *duodenum*, for the moſt part occaſioned by an obſtruction. Cullen, however, having not unfrequently obſerved in perſons, who laboured under the jaundice, the *fæces* of their natural colour, and even ſometimes a vomiting of a bilious matter, juſtly inferred, that the impeded evacuation of the bile into the *duodenum* could not be, at leaſt always, the cauſe of the jaundice. Yet, that he might accommodate the operations of nature to the eſtabliſhed theory, he ſtates, that the jaundice may be produced in two manners; either the paſſage of the bile toward the alimentary canal being ſtopped up; or the bile, when diſcharged into it in a greater quantity, being abſorbed by the lymphatic veſſels of the inteſtines: though he adds, that the latter cauſe ſeldom takes place *. The following arguments prove, that this opinion, even with the emendation of Dr. Cullen, does not agree with the phenomena of nature.

1, If the abſorbent veſſels of the veſica fellea ſhould take up the bile, they would always abſorb

* L. l. vol. iii, pt. 3, chap. iv, § 1817.

it,

it, as there is continually a great quantity of bile in the gall-bladder.

2, As thus it is evident, that the abſorbent veſſels of the veſica fellea do not take up bile itſelf; and if, nevertheleſs, the impeded flowing of the bile into the *duodenum* be moſtly the cauſe of the jaundice, as is commonly believed; it muſt naturally follow, that the gall-bladder would be always found preternaturally filled with a great quantity of bile in the bodies of thoſe, who died of jaundice: but the contrary very often happens.

3, If the origin of the jaundice were chiefly to be derived from the impeded evacuation of the bile, and it's great collection in the veſica fellea, then thoſe, who labour under the dropſy of the gall-bladder, in whom this organ is greatly diſtended, would be alſo afflicted with the higheſt degree of the jaundice; experience however proves, that, for the moſt part, not the leaſt mark of jaundice exiſts in ſuch perſons *.

4, A great quantity of ſtones is often found in the gall-bladder, without the leaſt mark of jaundice having ever appeared †.

5, The immortal Morgagni records many inſtances of the gall-bladder and it's duct having been obſtructed, and entirely impervious without jaundice ‡.

* Richter l. l. ſeite, 59 and 60.

† Morgagni, l. l. t. ii, lib. 3, epiſt. 37, art. 18, 19 & 20: Haller, *Opuſc. pathol. obſ.* xxxiii, *hiſt.* vii & xi.

‡ L. l. No. 31, 32, 33, 34, and 37.

6, Richter

6, Richter was once witneſs to the higheſt degree of jaundice in a woman, whoſe colour bordered upon black, her urine dark yellow, the fœces tainted with the bile, and ſhe was likewiſe attacked with a bilious vomiting; yet her body being opened, it appeared to be totally deſtitute of a gall-bladder *.

7, My dear friend, the learned Dr. Koole, has lately communicated to the phyſical ſociety of Rotterdam † a caſe of a lady ſixty one years of age, who, having laboured under a violent and continual fever during three days, complained of pain and tenſion at the region of the liver. A tumour enſued, terminating in an abſceſs, which being broken, three gall-ſtones, accompanied with a great quantity of green bile, were diſcharged at different times; after the diſcharge of which the wound was conſolidated within a few days, and all the ſymptoms diſappeared. This lady never complained of a bitter taſte in the mouth; neither the whites of the eyes nor the ſkin had a yellow, or any other preternatural colour; the urine appeared natural, and never brown or yellow; in fine, the fœces were by no means whitened, but always tainted with the bile in the ſame manner as in the healthy ſtate. This lady, having afterwards lived in perfect health for ſome years, was ſeized with an apoplectic fit, of which ſhe died, and the body being opened, the veſica fellea appeared to be quite changed into a

* L. I. cap. ii, ſeite 54, 55 & 61.

† *Verhandelingen van het Bataaviſh Genoodſchap der proefondervindelyke Wyſbegeerte te Rotterdam, eerſte deel*, p. 509 & ſeq.

ſpecies

ſpecies of ligament. It is evident from this obſervation both that the paſſage from the gall bladder into the inteſtines may be blocked up by ſtones, without either diſturbing the digeſtion, or occaſioning jaundice; and that, the veſica fellea being deſtroyed by diſeaſe, a perſon may nevertheleſs live in a perfectly healthy ſtate.

8, Dr. Gibſon records a caſe which ſerves to prove beyond doubt, both that the lymphatic veſſels of the gall-bladder do not abſorb the bile from it; and that, though it's duct be totally obſtructed, no jaundice thence ariſes. A boy twelve years of age, by falling from a wall, had received a ſevere contuſion in the right lateral part of the abdomen; and, after having ſuffered various diſorders, at laſt died of the dropſy. The body being opened, "The "gall-bladder was found continuous to all the con- "cave part of the liver, and was extended to a moſt "ſurpriſing bulk; for it contained no leſs than two "Scots pints, or eight pounds of bile, rather "thicker than the cyſtic generally is, and of which "ſeveral concentrical bags, incloſed one within "another, were formed; theſe had all the internal "figure of the gall-bladder, and differed from "each other only in this, that thoſe, which were "next to the *veſica*, were firmer, and more opake, "while the more internal were of a lighter green "colour, and of a more tender ſubſtance.

"The *Ductus communis choledochus* was larger "than uſual, and was filled with many ſmall ſpungy "ſtones of a yellowiſh hue, that ſwam in water*."

* *Med. Eſſays and Obſ.* vol. ii, art. xxx, p. 292 to 304.

Notwith-

Notwithſtanding the cyſtic bile was prevented from paſſing down into the inteſtines, and the gall-bladder was diſtended by a great quantity of bile in this caſe, no icteric ſymptom was obſerved in the boy during the whole courſe of the diſeaſe. Conſidering all this I willingly agree with Morgagni, that, though the duct of the veſica fellea be obſtructed, ſtill no jaundice ariſes, unleſs the ductus choledochus be at the ſame time blocked up, which does not often happen*.

Thus the ſtones of the gall-bladder are to be conſidered as the cauſe of the jaundice only in as much as ſometimes by irritating that viſcus, they act on the organs ſecerning the bile, hinder the ſecretion, put a ſtop to the flowing of the bile from them by ſpaſmodically contracting their orifices, and diſpoſe the abſorbent veſſels, which are numerous in the ſubſtance of the liver itſelf, to take up the bile ſtagnant in the biliary ducts, and carry it through the thoracic duct back again to the blood.

In fine, the hypotheſis of Cullen is by no means ſufficient to explain the phenomena of nature. For, it is nothing more than a mere aſſertion, that the bile, when carried in a greater quantity to the inteſtines, is abſorbed by the lymphatics, and thus excites a jaundice: there naturally exiſts a great quantity of bile in the inteſtines in the healthy ſtate, and therefore the abſorbent veſſels may always take it up, if they be capable of abſorbing the bile itſelf; and though it were granted, that the bile was

* L. l. art. x.

carried

carried off from the inteſtines by the abſorbent veſſels, yet a jaundice could by no means ariſe from this, becauſe this abſorbed bile would ſtill have to paſs through many glands, before it could arrive at the thoracic duct; ſo that it would be changed into a homogeneous liquor with the other fluids, and ſo be prevented from producing noxious effects.

It is evident therefore, that it is not the cyſtic bile, as is commonly believed, but the bile of the liver alone, which produces the jaundice: this bile exerting a ſpecific ſtimulating power, by which the ſolids are incited to ſuch motions, that a peculiar matter called icterical is ſecerned; which, according to it's different mode of acting, taints either the whole body, or only ſome part of it, with a yellow, green, or even blackiſh colour.

As, to produce the jaundice, it ſuffices, that certain determinate motions be communicated to the ſolids, not only from the bile, but alſo from many other ſtimuli, without the regurgitation of the bile into the blood; the veſſels may be diſpoſed in ſuch a manner, that the whole ſanguiferous ſyſtem becomes changed, as it were, into an organ preparing a ſubſtance like bile. This is demonſtrated by the following conſiderations.

1, For the jaundice to ariſe from the regurgitation of the bile, a certain time is neceſſary to convey into the blood a ſufficient quantity, to diſpoſe the veſſels to the requiſite motions: becauſe the abſorbed bile conveyed to the thoracic duct

enters

enters the blood only by drops, and blended with many other fluids. Hence the patients muſt feel diſordered ſome days before the jaundice ariſes. But the jaundice may be brought on, as it were, in a moment, by terrour, anger, the bite of a ſerpent, and different diſeaſes; of courſe, in ſuch caſes, it's cauſe certainly cannot be attributed to the reflux of the bile into the blood.

2, The ſymptoms, which foretel the approaching jaundice in other caſes, ſuch as anxiety at the region of the ſtomach, the pain, and ſenſe of weight and fulneſs on the right lateral part of the abdomen, the loſs of appetite, and the colicky pains, are moſtly wanting in theſe caſes, and the lateral parts of the abdomen are in a healthy ſtate; which evidently ſhows, that no diſorder either of the liver or the biliary ducts takes place.

3, There is not leſs difference obſerved between the ſymptoms during the courſe of the malady: for the fæces are not whitened; the body is not conſtipated, on the contrary, it is often more looſe than uſual; even bilious vomitings not unfrequently occur. Thus the paſſage of the bile to the inteſtines is by no means obſtructed*.

4, Thoſe, who labour under this ſpecies of jaundice, alſo require different remedies from thoſe, which are commonly adminiſtered in this diſeaſe. For inſtance, when this diſorder is cauſed by the

* Stoll l. l. pt. 3. ſect. v, p. 248, & p. 256; & Burſerius l. l. vol. iv, cap. xiii, p. 161.

bite

bite of a ſerpent, aperient, ſtimulant, antiſpaſmodic, and opiate medicines effect nothing; whereas remedies, by which the poiſon is enervated, and it's noxious effects prevented, are very advantageous: an evident ſign, that the jaundice in theſe caſes ought to be derived not from the diſturbed action of the biliary organs, but from a noxious ſtimulus directly operating on the ſanguiferous ſyſtem.

5, In the body of a woman who died of this diſtemper accompanied with dropſy, Tulpius found the liver arid, black, dry, and contracted like crumpled leather, ſo that it was ſcarcely as big as the fiſt*. Baron van Swieten likewiſe obſerved frequently ſuch arid and dry livers in the bodies of icterical patients†. Whence it is manifeſt that, whatever might have been the cauſe of the jaundice, yet in theſe caſes the diſorder could by no means be kept up by the reflux of the bile into the blood, but by another ſtimulus exciting the vaſcular ſyſtem into motions of a peculiar kind.

6, That the jaundice ſometimes takes place without the regurgitation of bile into the blood was well known to the ancients, though they had leſs accurately penetrated into it's cauſe: as they have not only recorded, that the whole ſkin, the ſaliva, and the other fluids, may become yellow without regurgitation of the bile, but beſides have

* L. l. lib. ii, cap. 36, p. 151.

† L. l. t. iii. § 950, p. 143.

moſt

moſt accurately deſcribed the ſymptoms, by which theſe two ſpecies of jaundice may be diſcriminated *. An evident token, that this diſtinction of the jaundice is founded on the obſervations of nature.

The ſanguiferous ſyſtem, affected in a ſpecific manner, either by the bile, or by any other ſtimulus, runs into irregular motions with ſuch effect, that a bilious humour is ſecerned through it's whole extent.

That in reality nature proceeds in ſuch a way, and that the yellow colour of the ſkin is not to be explained from the abſorption of bile, but from a bilious humour ſecerned by the morbid action of the veſſels, is proved, not only by the above obſervations both of Tulpius and van Swieten, in which, though the liver was dry and arid, all the parts of the body were tainted with a dark yellow colour, but likewiſe by caſes related by Stoll, in which the duct of the gall-bladder, the duct of the liver, and the ductus choledochus, were found impervious throughout, and cloſed by a hard calculous matter; and nevertheleſs the fœces were either yellow, or æruginous †. Here no bile could proceed toward the alimentary canal, the paſſage being totally blocked up; yet the fæces were tinged with a bilious colour. Hence it neceſſarily follows, that the mucus commonly ſecerned in the inteſtines (*ſuccus entericus*) was changed into a bilious humour by the altered action of the veſſels; and that

* Bonnetus, *Theſ. med. pract.* t. ii, lib. iv, cap. 49, p. 855: R. Vogel, l. l. § 633: & Burſerius, l. l. t. iv, § 157.

† Stoll, l. l. pt. 3, ſect. 5, obſ. v, p. 153.

by

this fluid imparted to the fæces the above colour; which is farther confirmed from this, that, in an inveterate jaundice, as I ſhall afterwards prove, all the ſecerned humours become infected with a yellow colour.

Now as the effects are always in the compound ratio of the ſtimulus applied, and the reaction of the organs depending upon the organical ſtructure of the parts affected, it is eaſy to explain, why often not the whole habit, but the face alone, and eſpecially the whites of the eyes, diſplay a yellow colour, and why the jaundice ſometimes occupies only the half of the body. Hence, too, may be explained a ſingular phenomenon, mentioned by Dr. Burſerius, of an icterical patient, forty years of age, whoſe whole face to the throat was green, the right ſide of his body black, and the left yellow: for the ſame ſtimulus may have various effects, according to the different reaction of the organs; the ſame ſtimulus, though applied to organs of the ſame ſtructure, but with an unequal force, may produce a difference in the ſymptoms; and all the ſpecies of the jaundice only differ in their degree. From the ſame ſource ought alſo to be derived the reaſon, why all the ſecerned humours are moſtly found in a natural ſtate in the commencement of this diſorder the urine alone excepted; and why the infant may generally ſuck the breaſt either of a mother, or a nurſe, who labours under the jaundice, without the leaſt injury*: for the organization of the other ſecerning

* *Act. ſerv. Civib. dicat.* t. xii, p. 1, § 26, p. 13.

organs prevents them from being ſo eaſily altered by the noxious cauſe, as the urinary organs; and the reaction of the vital powers always in part expels from the body the morbid matter, the excretion of which is moſtly performed by the urine. However, when the jaundice has either continued for a long time, or proves very ſevere, the ſaliva, ſweat, fat, in a word, all the ſecerned humours acquire a yellow colour, and the muſcles, the viſcera, the cartilages, and the bones, become yellow *. Even the blood is at times totally changed into a bilious humour, as it were; ſome caſes of which are mentioned by Morgagni †.

When once the jaundice is produced, the ſecerned bilious matter continually ſtimulates the ſolids: therefore the *natura medicatrix* directly attempts it's expulſion; and hence originates the turbid, croceous, or dark yellow urine, obſerved in this diſeaſe. And by theſe means the jaundice often ſpontaneouſly diſappears, when it's cauſe is eaſy to be removed: whereas this diſorder, though ſeeming to be cured, ſometimes returns at ſeveral intervals; which phenomenon ſeems to me to be owing partly to this, that the ſtimulus, which diſpoſes the ſolids to the ſecretion of a bilious liquor, operates only by paroxyſms; but chiefly from this rule of nature, that, if the jaundice repeatedly attack a perſon, the diſpoſition to prepare a bilious humour at a certain period becomes, as it were, impreſſed on the vaſcular ſyſtem.

* Vogel, *Præl. Acad.* § 632, p. 528; Burſerius, l. l. vol. iv, cap. xiii, § 160; & Stoll, l. l. pt. 3, ſect. v, obſ. vii, p. 259 & 260.

† Morgagni, l. l. t. ii, lib. iii. epiſt. xxxvii, n. vii: & Vogel, l. l.

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The prognoſis of the jaundice differs according to it's various cauſes. In general, when it ariſes in a ſound body from the regurgitation of the bile into the ſanguiferous ſyſtem, it never brings on death: thoſe caſes alone excepted, where the jaundice is produced by an obſtruction of the ductus choledochus, in which life is deſtroyed, unleſs the ſtone, by an ulcerating proceſs, makes it's way into the duodenum, or the duct becomes ſo dilated, that the bile can freely paſs by the ſtone into the alimentary canal. But if this diſorder be generated by any other ſtimulus without the regurgitation of the bile, no general rule can be laid down as to it's termination; becauſe the jaundice is then almoſt always complicated with ſome other diſeaſe, and very often is only a bad ſymptom of it. In general this ſpecies is more dangerous than the other ariſing from the regurgitation of the bile. The fever eſpecially, which frequently accompanies this kind of jaundice, is always ominous. Stoll has obſerved the jaundice, when attended with fever, either fatal, or very dangerous *: and this is confirmed by the obſervations of Burſerius and Graewen †.

I have twice had an opportunity of obſerving the jaundice attended with fever. In both caſes the whole body was of a dark yellow colour; objects appeared yellow; the fœces were tainted with the bile in the uſual way; the appetite was much ſtronger than natural; the patients were walking

* L. l. p. 244, et ſeq.

† Burſerius, l. l. t. iv, cap. xiii, p. 458: & *Act. ſerv. Civib.* l. l. p. 127.

about for a long time, and did not believe the danger they were in. They became however gradually weaker; and died at length hectic. It ought here to be obſerved, that every jaundice which ſucceeds a fever is not ſymptomatic; for it may ſometimes ariſe from a diſturbed criſis. Hence Hippocrates pronounces the jaundice dangerous, when happening in fevers before the ſeventh day of the diſtemper*; as the criſis commonly arrived at this time. When the jaundice is critical, the patient finds himſelf greatly relieved by it; when it is ſymptomatic, he is on the contrary much worſe.

The jaundice ariſing either from the regurgitation of the bile, or from ſome other ſtimulus, is cured by a turbid, thick, and copious urine; by a thick, fetid, and yellow ſweat; by a looſeneſs; by the hemorrhoids, by a tranſlation of the diſeaſe, to ſome organ†; by a ſcarlet or miliary fever‡; or by the eruption of a peculiar ſubſtance, reſembling, as it were, calculous grit, which truly ſingular event, obſerved by the celebrated Voltelen, is deſcribed by Dr. Groen. A certain lady, having laboured under various diſorders, fell into a periodical jaundice, the cure of which was in vain attempted by aperients, demulcents, carminatives, antiſpaſmodics, and opiates; to all which remedies the jaundice proved obſtinate, and the patient became daily more and more enfeebled. Dr. Voltelen, attending the lady, conceived the idea, that a ſtone

* *Aphoriſ.* ſect. iv, aphor. 64.

† Stoll, *Rat. Med.* l. l. obſ. 18, p. 276.

‡ Stoll, l. l. obſ. ii, p. 267.

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in the gall-bladder was the cauſe of the jaundice. Accordingly, having firſt ſtrengthened the patient a little, he gave her the famous remedy of Dr. Durande, compoſed of equal parts of vitriolic ether, and oil of turpentine. During the uſe of this, firſt pains aroſe in different parts of the body, particularly at the wriſts; and afterwards ſome calculous matter was depoſited at theſe places, with great relief to the patient. Accurate obſervation taught Dr. Voltelen, " That ſuch a depoſition occurred after every new " paroxyſm of the jaundice; that a violent itching " conſtantly preceded it in the parts where it was " to take place; at length a ſmall yellowiſh pimple " was obſerved, which greatly increaſed both in " bulk and ſolidity; and the pimple, when acci- " dentally opened in the beginning, before it had " acquired conſiſtence, diſcharged a viſcous, tena- " cious, yellowiſh, and acrid matter, which cor- " roded the ſurrounding ſkin. This depoſition " happened chiefly at thoſe places, where the parts " had been conſtricted by preſſure. Thus, for " inſtance, the ring finger ſhowed firſt a circle " marked with a yellow humour, and afterwards " ſurrounded, as it were, with a certain incruſta- " tion. In the mean time the urine depoſited a " copious arenaceous and yellowiſh ſediment for " many days. The paroxyſm could ſometimes be " prevented by hard riding on horſeback, a large " quantity of thick turbid urine being diſcharged " in conſequence for ſome days, and the cutaneous " eruption appearing at the ſame time. No ſtone " was diſcovered either before or after. The erup- " tion totally ceaſed during the continued uſe of " this remedy: however a yellowiſh, thick urine,

" full of an arenaceous ſediment, was continually " diſcharged *."

From theſe ſymptoms Dr. Groen concludes, that a ſtone of the gall-bladder exiſted in this caſe; which, being reſolved by the above remedy, was carried to the ſurface by a ſalutiferous effort of the vital powers. However, though I do not deny, but that almoſt all the ſymptoms, which commonly attend the ſtone in the gall-bladder, exiſted in this caſe, many reaſons prevent me from agreeing with Dr. Groen. In the firſt place, we have hitherto no certain ſign by which we can judge of the ſtone in the gall-bladder; and every token of it may deceive, as the doctor himſelf obſerves †. In the ſecond place, the more I conſider the hiſtory of the diſeaſe, the leſs can I believe, that a ſtone in the gall-bladder was the cauſe of this jaundice: for we have already obſerved, that ſtones in the gall-bladder, though rendering it's duct totally impervious, never produce a jaundice, except by diſturbing the action of the biliary ducts. Now if a regurgitation of bile be produced by the irritation of the ſtones, it is true a jaundice ariſes: but the patients always exhibit, more or leſs, an icterical countenance; as the irritating cauſe never ceaſes in theſe caſes ‡. Some phyſicians relate, indeed, that they have obſerved a periodical jaundice from ſtones in the gall-bladder. This aſſer-

* *De Calculorum Geneſi*, p. 60, et ſeq.

† L. l. p. 65.

‡ Bianchi, *Hiſtoria hepatica:* and *Med. Eſſays and Obſ.*, vol. ii, art. xxvii.

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tion, however, ſeems to derive it's origin from a mere hypotheſis, and by no means to be founded on the obſervation of nature: for it is beyond all doubt, that ſtones in the gall bladder often exiſt without occaſioning the jaundice; therefore I do not comprehend with what right ſtones in the veſica fellea can be deemed the cauſe of the jaundice, in the caſes where they accompany this diſtemper; ſince there is not the leaſt reaſon, why the jaundice may not ariſe as well in patients, who labour under ſtones of the gall-bladder, as in healthy perſons, from the operation of a morbid ſtimulus. Thus it ſeems to me highly probable, that the periodical jaundice in theſe caſes did not owe it's origin to ſtones of the gall-bladder, but to another morbid ſtimulus: ſince ſtones in the gall-bladder by themſelves never cauſe the jaundice; and when they do occaſion it by diſturbing the functions of the biliary organs, the diſorder always remains, till it's cauſe is removed.

Let it not be argued, that morbid cauſes, though conſtantly remaining, very often produce periodical diſeaſes; as is proved by the intermitting fever, the epilepſy, and many other diſorders: for the modification of theſe diſtempers depends both upon the difference of the morbid ſtimulus, and the reaction of the vital principle; ſo that, for inſtance, according to the different acting of the noxious power, and the reaction of the vital principle, either a quotidian ague, a tertian, a quartan, or a continual fever is produced. But it is a quite different affair with ſtones in the gall-bladder. Theſe, when occaſioning the jaundice, produce it only by

disturbing the action of the biliary ducts in consequence of their sharp points: thus as long as this cause exists, the jaundice also proves incurable. This cause is only to be removed by the absorption of these sharp points by the lymphatic vessels; which, however, seldom happens, both on account of the total alteration of the structure of the gall-bladder, and because new strata are daily adding to the stones.

It may, perhaps, be objected, that even by the strata, which are daily added to the stones, their sharp points must at last become blunt, and consequently the jaundice must disappear. But that this objection is of no weight will readily appear on considering, that, even though it were true, that by the addition of fresh strata the sharp points grow blunt, the jaundice would indeed disappear, but a periodical one would by no means be produced. Nobody, surely, will venture to maintain, that a jaundice periodically returning, for instance, every month, may be explained from this source. Besides, this objection does not agree with the phenomena of nature: for that the sharp points of stones in the human body by no means grow blunt by the addition of fresh strata is put beyond all doubt, by numerous instances of those who labour under the stone of the urinary bladder. It is commonly known, that the sharp points, which are frequently met with in stones in the urinary bladder, occasion the most acute pains to the patients; and it is not less certain, that though these stones daily increase by the addition of fresh strata, nevertheless the pains, instead of being lessened by the growth

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of the ſtones, grow daily worſe and worſe, and that, unleſs the ſtone be either extracted from the body by lithotomy, or the action of it's ſharp points prevented by rendering the internal coat of the bladder inſenſible, and, as it were, callous to the morbid ſtimulus by the uſe of medicines, the phyſician is obliged continually to adminiſter opium, to abate the rending pains cauſed by them. Therefore, as the intermitting fevers and epilepſy are periodical diſeaſes, only becauſe their noxious power operates at intervals; and they have different paroxyſms, according to the different intermiſſion of the morbid ſtimulus; ſo the jaundice, when ariſing from gall-ſtones, muſt prove perpetual, on account of the continual irritation of the ſtones.

Thus it is requiſite to jaundice, ariſing from a ſtone in the gall-bladder, that the patients have an icterical countenance, in a greater or leſs degree, from the commencement of the diſorder till it's termination. At leaſt no caſe proving the contrary has hitherto, as far as I know, been publiſhed. But the jaundice diſappeared at the ceſſation of the paroxyſm in the above caſe. Moreover the approaching paroxyſm could ſometimes be prevented by a hard ride on horſeback: yet no one will venture to aſſert, that a ride on horſeback has the power of preventing a ſtone in the gall-bladder from bringing on the jaundice by it's irritation. It is evident, too, from the whole hiſtory of the diſeaſe, that the patient was already weakened by different diſorders, before ſhe was afflicted with the jaundice; of courſe it is highly

highly probable, that in the above caſe the jaundice, generated once or twice by accidental cauſes, had at length impreſſed on the vaſcular ſyſtem a diſpoſition to prepare a bilious fluid at a certain and determinate period; the more, as, according to the obſervations of practitioners, the jaundice becomes, as it were, a habitual diſorder, if a perſon labour under it more than once. Laſtly, if we inquire a little more accurately into the eruption itſelf, how great an analogy do we not find between this, and the other exanthematous eruptions! So great, indeed, that no difference exiſts between them, excepting what regards the conſiſtence of the matter ſecerned. When treating of the exanthematous diſeaſes, I proved, that in them the morbid matter, ſeparated from the blood and depoſited at the ſurface of the body by the vital powers, is farther ſubdued by the ſecerning veſſels, which afterwards prepare a peculiar ſubſtance from it. Now the ſymptoms being the ſame, may it not with juſtice be concluded, that likewiſe in this caſe the bilious matter was ſeparated from the blood by a peculiar action of the ſolids, incited by the remedy preſcribed; and that this manifeſted itſelf at the ſurface under the forms of pimples turgid with a yellowiſh acrid matter? For, that this matter quickly changed into cryſtals, or bilious concretions, demonſtrates nothing but that the action of the veſſels was already ſo vitiated, that bile of a depraved nature, and ſoon cryſtallizing, was ſecerned inſtead of healthy bile. The ſucceſs, with which the famous remedy of Dr. Durande was given, is equally far from proving in the leaſt the exiſtence of a ſtone in the veſica fellea. For,

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though I readily agree, that, both in the periodical jaundice, and in this diſeaſe when occaſioned by gall-ſtones, ſome precautions being obſerved, nothing is better, than this remedy on many occaſions; yet I do not heſitate to aſſert, that it is as little capable as other remedies of reſolving a ſtone in the gall-bladder. Bilious concretions no doubt have ſometimes been diſcharged by ſtool after it's uſe: but Cullen obſerves, that the ſame not unfrequently happens after uſing emetics*; Dr. van der Wynperſſe confirms this by a remarkable inſtance†. And van Swieten relates, "That he cured a woman, ſixty years of age, who had laboured under "the jaundice during twelve years; which, periodically returning in the beginning, continually remained during the laſt year; by a long "continued uſe of reſolvents, eſpecially the juice "of the dog-graſs, whey, and ſoap; by which," I employ his own words, "at length this infarcted "matter of the liver began to be reſolved, and a "looſeneſs enſued for ſix whole months; an extremely fetid argillaceous matter, intermingled "throughout with ſmall ſharp calculous granules, "being diſcharged, with relief of all the ſymptoms‡." If, therefore, it were to be concluded, that all the remedies, after the uſe of which bilious concretions appear, operate by reſolving ſtones in the gall-bladder, the faculty of reſolving theſe ſtones ought to be imputed not only to the vitriolic ether, but alſo to emetics, and even to the mildeſt

* L. l. § 1825, p. 445.

† *Act. ſervand. Civib.* t. xiii, pt. i, p. 284.

‡ L. l. t. iii, § 950, p. 130.

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aperients. But who will maintain, that emetics have the property of diſſolving ſtones in the gall-bladder? Who would affirm, that dandelion, the gramen caninum, whey, and ſoap, poſſeſs ſuch virtue, that, after being conveyed through the whole body, they are ſtill able to reſolve inveterate bilious concretions? Will not every one, attending to all this, willingly grant, that the diſcharge of theſe ſtones is rather to be imputed to a ſalutary effort of the vital powers, rouſed to action by the above medicines? But, that the leaſt doubt may not remain on this ſubject, I ſhall directly demonſtrate, the abſolute impoſſibility of reſolving a ſtone in the gall-bladder by any medicine. Every medicine is firſt received into the ſtomach, and undergoes it's action: it is thence tranſmitted to the inteſtines, and, being there altered anew, it is at length taken up by the lymphatics. After being abſorbed by theſe, it has ſtill to paſs through many conglobate glands, where it undergoes a great change; which is wiſely ordained by nature, that, in caſe the elective faculty of the orifices of the abſorbent veſſels ſhould chance to be deceived, noxious ſubſtances, though abſorbed, might thus be prevented from mixing with the blood, without a previous aſſimilation. Thus blended with many other fluids, it enters the thoracic duct, and is mixed with the blood by drops: till at laſt, having circulated with the blood through the whole body, it is conveyed to the gall-bladder. Now though I willingly grant, that many remedies ſpecifically operate on ſome particular organ by a kind of ſympathy; though I likewiſe allow, that medicines are only in part altered, and cannot be wholly changed by the vital powers; yet

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is it to be believed, that a medicine, which undergoes so many changes in the *primæ viæ*, and which, before it arrives at the destined part, must pass through so great a number of vessels, all possessing the faculty of altering the nature of the humours contained in them, would still possess a sufficient power chymically to resolve the stone itself? In reality this seems to me quite contrary to sound reasoning. But, on the other hand, granting, that in fact a medicine could exist strong enough entirely to escape the action of our organs, what would be the consequence of it's use? It would enter the blood unaltered. Now consider only what effects any medicine, capable of chymically dissolving calculous concretions, must have on the blood-vessels themselves, the structure of which is certainly far more delicate than that of bilious stones; must it not be much apter to corrode, and totally destroy their organical composition? Indeed nothing less could be expected from such a medicine, than death amidst universal convulsions. I conclude therefore, that, though several solvents of biliary concretions out of the body have been discovered, yet there is not the least probability, that they could reach these concretions while lodged within it.

Let it not be argued, that medicines able to dissolve a stone in the urinary bladder are not wanting: for I am perfectly satisfied, that it is likewise impossible to dissolve a stone, when existing in the urinary bladder. I know indeed, that the mephitic water has acquired great celebrity in the present day; and that when this medicine has been administered to persons, labouring under a stone of the

bladder, eſpecially in the commencement of the diſeaſe, all the ſymptoms of this grievous diſorder not unfrequently diſappear; and by it's uſe ſuch perſons are afterwards enabled to enjoy a tolerably healthy ſtate during many years. But I know alſo, that in the bodies of ſuch perſons the ſtone was always found intire: an evident token, that this medicine by no means operates by chymically reſolving the calculous concretion. It muſt be confeſſed, it is of great utility in the calculous gravel, by preventing the formation of the ſtone; and in the ſtone itſelf, by abating or removing the tormenting ſymptoms of the diſorder, on account of a ſpecific action it ſeems to have on the urinary organs, which renders the freſh ſtrata added to the ſtone of a ſoft ſpongy texture, inſtead of a hard calculous ſubſtance, and conſequently prevents the ſtone from irritating the internal coat of the bladder. That this is really the caſe, has been proved beyond diſpute by the celebrated Mr. Cline, ſurgeon and lecturer on anatomy and ſurgery at St. Thomas's Hoſpital, by a great number of ſpecimens taken from patients, that died during the uſe of this remedy.

Even the caſes related by Dr. Durande demonſtrate, that this remedy does not operate as a chymical menſtruum, but in a quite different manner. For he mentions, that the fragments of the ſtone were diſcharged by ſtool in ſome ſubjects, but not in others; and that it proved equally ſucceſsful in both caſes*; which evidently ſhows, that this me-

* Murray, l. l. vol. i, p. 29 & 30.

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dicine operates on the jaundice itſelf, and by no means reſolves the ſtones of the gall-bladder. With reſpect to the fragments of ſtones obſerved by Dr. Durande in ſome patients, I greatly queſtion, whether theſe apparent fragments are not rather to be looked upon as ſo many different ſtones; the analagous ſtructure of them all might eaſily lead Dr. Durande at the time into a miſtake: at preſent it is demonſtrated by the celebrated Soemmering, that ſtones of the gall-bladder are always of a ſimilar ſtructure in the ſame perſon*.

From what I have proved, the following general inferences reſult:

1, That the jaundice was not ingendered by a ſtone in the gall-bladder in the above caſe.

2, That ſtones in the animal body can be reſolved neither by vitriolic ether, nor by any other medicine.

3, That, notwithſtanding, the vitriolic ether may be given in many caſes of the jaundice with the greateſt expectation of ſucceſs: nay, that it often promotes the paſſage of the ſtone itſelf, by removing the ſpaſm of the duct of the gall-bladder through it's eminent antiſpaſmodic virtue.

The general indications of cure in the jaundice are the three following:

* Soemmering *de Concrementis biliariis Corporis humani*, § xvii, p. 35.

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1, The morbid cauſe, which has brought on the diſeaſe, is to be removed; or, if it be not removeable, at leaſt a ſtop muſt be put to it's action.

2, Such a diſpoſition ought to be excited in the ſolids, that they may ſeparate the bilious matter from the blood, and expel it from the body by the emunctories; and, if the diſpoſition to ſecern a bilious humour at certain intervals be impreſſed on the ſolids, it muſt be aboliſhed.

3, Tonics ſhould be given to prevent any relapſe of the diſeaſe.

But though theſe indications are to be obſerved in every jaundice, yet the remedies, by which the firſt indication is to be accompliſhed, ought to be very different, according to the different morbid cauſe. Hence if the jaundice ariſe from ſordes of the *primæ viæ*, emetics and purgatives are ſufficient to the cure. If the diſeaſe be occaſioned by exceſs of irritability, opium, ſmall doſes of ipecacuanha, extract of belladonna, and the warm bath, are to be preſcribed. If a periodical jaundice be produced by a ſpaſmodic conſtriction, as is ſometimes obſerved in hyſterical and hypochondriacal perſons, it is to be cured by frictions; and by valerian, the ferulaceous gums, eſpecially the aſafœtida, and other remedies of this kind, taken internally. In each of the laſt two caſes a bliſter applied to the abdomen is alſo found very uſeful. When the diſorder ariſes from the retropulſion of ſome morbid matter, the ſpiritus Mindereri, crude antimony, the woody-nightſhade, opium joined with ipecacuanha, an infuſion of the laſt, &c. are beneficial. If the diſorder be pro-

duced

duced by a morbid ſtate of the viſcera (obſtructions), aperients are requiſite, which ſhould be of a more or leſs ſtimulant nature according to the circumſtances. It ſhould be obſerved, however, that their uſe muſt not be too long protracted; for though aperients are efficacious in the commencement of the diſtemper, yet, when too long continued, by weakening the body too much, they not only prevent the jaundice from being cured, but, on the contrary, promote the diſorder, and render it daily more and more obſtinate.

When the jaundice is produced by ſtones, the *natura medicatrix* muſt perform the principal part of the cure; by the ſalutary efforts of which the biliary ducts become ſo dilated, that either the bile again freely paſſes into the duodenum, or the ſtones themſelves deſcend into the alimentary canal through the dilated ducts, and are thus diſcharged by ſtool; which is not to be wondered at, as Morgagni has demonſtrated by many inſtances, that the dilation of the ductus choledochus is often very great *. It is the buſineſs of phyſic to aſſiſt theſe efforts of nature by a repeated, but prudent uſe of emetics †; and by the uſe of the vitriolic ether, combined with an equal portion of oil of turpentine, which laſt medicine principally agrees with weakened and irritable bodies from it's ſtimulant, and antiſpaſmodic power. Opium and the warm bath alſo prove ſalutary. The lixivium ſaponarium has likewiſe been uſed with ſucceſs. Another

* L. l. *epiſt.* xxxvii, art. 46 & 47.

† Cullen, l. l. § 1825 and the following.

medium, by which nature gets rid of the ſtone, is by exerting inflammation in the neighbouring part of the duodenum, which, terminating in an ulcerating proceſs, the ſtone is expelled the body by ſtool. If no material cauſe of the jaundice appear, opium and other anodynes, and antiſpaſmodics and demulcents are to be employed, both externally and internally, to diminiſh the action of the morbid ſtimulus; which they not only do, but often effect a radical cure, as the illuſtrious Richter has proved by many examples *.

The ſecond indication is very often anſwered by accompliſhing the firſt: at the ſame time mild diaphoretics and diuretics may be given at bed-time with great advantage.

If the diſpoſition to the jaundice be impreſſed on the ſolids, the remedy of Dr. Durande, conſiſting of vitriolic ether, joined with an equal quantity of oil of turpentine, proves the moſt powerful, which, therefore, what was neceſſary being premiſed, ſhould never be omitted.

As torpor of the vital principle, for the moſt part, accompanies this diſorder, in a greater or leſs degree, it never requires bleeding of itſelf; but, on the contrary, both the former indications being anſwered, the phyſician ought to have recourſe to bitters, the bark, and preparations of iron, to ſtrengthen the general habit; and even in many caſes it proves uſeful to join tonics with aperients from the commencement of the diſorder.

* L. 1. kapitel ii, p. 66.

When

When the jaundice proves incurable, in that kind of the diſorder that is attended with a fever, an inflammation of the liver often enſues, in which caſe patients are killed either by the violence of the inflammation, by the gangrene ſucceeding to it, or by the ſuppuration of this organ, in the laſt of which caſes they generally die tabid. However, if, as is not ſeldom the caſe, this kind of jaundice be only a bad ſymptom of another diſeaſe, life is extinguiſhed in different ways, according to the different diſorder, which the jaundice accompanies. In the chronic jaundice, which moſt frequently occurs, and is unattended with fever, when the diſeaſe is inveterate, either a dropſy takes place, or the organical ſtructure of the liver is entirely deſtroyed by the continually irritating morbid ſtimulus. In the firſt of theſe caſes, according to the teſtimony of Ludwig*, no hope of recovery remains: and, indeed, if we conſider that the dropſy in ſuch caſes owes it's origin to the relaxed tone of the whole body, and to the alteration in the ſtructure of the abdominal viſcera, it will readily appear, that but very ſmall hopes of cure can exiſt. Life, however, is often protracted for ſome weeks; but, at length, ſooner or later, according to the different ſtates of the patients, and their different ages, death cloſes the ſcene; and, as far as I know, no inſtance of a recovery from a confirmed jaundice, combined with a dropſy, has hitherto been ſeen. In the ſecond caſe, a tabes, accompanied with a hectic fever ariſes, and life is taken away in the ſame manner, as in the tabes itſelf.

* *Inſtit. Therapeiæ generalis*, pt. ii, tract. 3, cap. vii, § 848, p. 397 & 398.

GENUS III.

Dropſy.

The dropſy is a collection of a ſerous fluid either in ſome particular part of the body, or over the whole ſurface, moſtly attended with ſwelling, thirſt, difficulty of breathing, coſtiveneſs, and a paucity of urine.

The three chief ſpecies are, aſcites, anaſarca, and hydrothorax. *Aſcites* is either a regular ſoft uniform tumour of the whole abdomen, with a ſufficiently evident fluctuation; or a partial tumour of the abdomen, moſtly attended with an obſcure fluctuation. In the latter caſe the diſorder is denominated encyſted dropſy. The *anaſarca* has it's ſeat in the cellular membrane. It may be either univerſal or particular; and is characterized, at leaſt in the beginning, by ſoft, white, cold, indolent, and ſcarce elaſtic tumours. The *hydrothorax* is often very difficult to be diſcovered, and has, ſtrictly ſpeaking, no characteriſtic ſymptoms. The diſorder, however, is moſtly attended with dyſpnœa, pallid countenance, œdematous ſwellings of the feet and hands, a tumefaction of the ſcrotum with relief of all the ſymptoms, little urine, difficulty of lying down, ſudden ſtarting from ſleep, palpitation of the heart, irregular pulſe, and ſometimes a fluctuation of water in the cheſt.

It

It is not my purpoſe ſeparately to ſpeak of every ſpecies of this diſeaſe; I ſhall only treat of dropſy in general, and lay down ſome rules regarding it's cauſes, prognoſis, treatment, and manner of killing. This general review of dropſy is the more ſufficient, as, though ſome cautions are to be obſerved, according to the different parts, in which the watery collection takes place, yet the indications of cure always remain the ſame, and, under the ſame circumſtances, the hydrothorax requires nearly the ſame treatment as the aſcites and anaſarca; ſo that the difference of cure in dropſy, for the moſt part, does not depend upon the difference of the part affected, but upon the various cauſes, which have brought on the diſeaſe. Aſcites may be diſtinguiſhed from the tumour of pregnancy, by the want of the uſual ſigns of the latter; as amenorrhœa, enlargement of the breaſts, the change of the areola, gradual enlargement of the abdomen, and quickening; and by the countenance of the patient, the general ſtate of the ſyſtem, the ſmall quantity of urine diſcharged, thirſt, and the ſenſe of fluctuation.

The dropſy may ariſe from two oppoſite ſtates of the body; increaſed action, and debility. In the firſt, the diſeaſe is brought on either, when an inflammation terminates in a ſerous effuſion; or when, on account of the plethora, the equilibrium between the ſanguiferous veſſels and the blood being deſtroyed, an apparent debility of the whole ſyſtem is induced: for, unleſs this be removed by bleeding, the veſſels at length yield to the preſſure of the column of blood, and an effuſion of a ſerous

humour by a diapedeſis takes place. In this caſe the dropſy is produced by an apparent torpor of the vital principle; or by a ſuppreſſion of the functions by the ſuperabundant blood, by which both the effuſion of a ſerous fluid is produced, and the lymphatic veſſels, from the languor of their *vita propria*, are prevented from taking up the effuſed fluid.

The dropſy originating from debility is commonly believed to be owing to diſeaſed viſcera (obſtructions); though, in reality, the morbid ſtate of the viſcera ſeldom produces this diſorder; indeed, that the degeneracy of the viſcera, when obſerved in dropſy, except in people, who have been in the habit of daily intoxication, is generally the effect and not the cauſe of the complaint, is particularly manifeſt from the aſcites: for all the ſymptoms uſually accompanying diſeaſed viſcera are for the moſt part entirely wanting in the commencement of this diſeaſe, and only appear towards the end of it; an evident token, that they are to be looked upon as the effects of the dropſy, and by no means as it's cauſe. Nay it is not uncommon, that, even at the firſt tapping of the patient, all the abdominal viſcera are of their natural ſize and ſoftneſs; while at the next, the omentum is not unfrequently felt of a preternatural thickneſs; and at the following the lateral parts of the abdomen, which in the beginning of the diſeaſe appeared in their natural ſtate, exhibit an indurated and enlarged liver and ſpleen. Theſe phenomena ſo often occur, that every ſurgeon, who has paid due attention to his dropſical patients, muſt be aware of them. Beſides perſons

labouring

labouring under ſcirrhoſity of the viſcera in general are not afflicted with the dropſy. Tiſſot, Du Verney, and others, found the liver quite ſcirrhous without the leaſt ſymptom of dropſy ever appearing during life: I myſelf have had an opportunity of inſpecting ſeveral bodies with a diſeaſed ſtate of the liver; but in none of them did I meet with a collection of any fluid; which evidently ſhows, that, when the ſcirrhous ſtate of this organ is combined with dropſy, it is the effect, and by no means the cauſe of the diſeaſe. The morbid ſtate of the viſcera (obſtructions), however, may ſometimes, as an occaſional cauſe, excite dropſy; as well as aperients, when too long continued to cure this morbid ſtate, by weakening the whole body, and particularly the abſorbent ſyſtem, may bring on a predispoſition to it. In fine, I do not deny, but that this diſeaſe may ſometimes ariſe from the degeneracy of the meſenteric glands*; which would more frequently happen, if the neighbouring glands did not perform the functions of the diſeaſed ones, and ſuch glands, for the moſt part, ſtill remain pervious †.

The cauſe of dropſy, as Richter, to whom the art of phyſic is obliged for many diſcoveries, has clearly demonſtrated, is, for the moſt part, a ſtimulus, which operating on the abſorbents, throws them into irregular motions, and thus prevents the lymphatics from performing their uſual functions.

* Maſcagni *Prodrome d' un Ouvrage ſur le Syſtème des Vaiſſeaux lymphatiques.*

† Soemmering *de Morbis Vaſorum abſorb.* § 48, p. 231.

Now as the more the body is weakened, the more eaſily it is affected by the morbid powers, it is eaſy to be underſtood, why women and weak ſubjects are more liable than others to this diſeaſe. Debility alone, however, does not ſuffice for producing dropſy; and, on the contrary, dropſy may ſometimes attack ſtrong and vigorous bodies, if the noxious ſtimulus, acting upon the lymphatic ſyſtem, be ſufficiently violent. This was already obſerved by the learned Vogel; who remarks, that, though the immediate cauſe of every dropſy is believed by moſt phyſicians to be an atony or relaxation of the whole ſyſtem, nevertheleſs many cachectical perſons are entirely free from the diſorder; whereas thoſe, who labour under the encyſted dropſy, are often hearty enough, and remain free from all cachexia for a long time*. What is aſſerted here of the encyſted dropſy holds likewiſe good with reſpect both to the anaſarca and the aſcites; though not ſo generally with reſpect to the laſt, in which a ſallow countenance often occurs even at an early period of the diſeaſe.

Thus it appears, that the remote cauſes of dropſy are numerous; that the prediſpoſition to this diſeaſe conſiſts in a real or apparent debility, either of the ſyſtem at large, or of the abſorbent veſſels; and that the occaſional cauſes all operate by communicating too great irritability, either to the general habit, or to the lymphatic ſyſtem. The proximate cauſe of courſe ſeems to be a certain degree of debility joined with a morbid increaſed irritability.

* L. 1. § 656, p. 555.

The

The prognoſis differs according to the different cauſes of the diſeaſe, the different ſeats of the complaint, it's continuance, and the habit of the patient. The dropſy originating from ſuppreſſed perſpiration is more eaſily cured, than that which happens after large evacuations. There is uſually greater hopes of cure in the anaſarca, than in the aſcites; and the hydrothorax is the moſt difficult to be remedied. In recent caſes the prognoſis is much more favourable, than where the viſcera are diſeaſed in conſequence of the diſorder. A ſallow or jaundiced complexion is more ominous, than when a ſufficient degree of ſtrength is ſtill left.

The cure of dropſy is to be attempted from three general indications.

1, The exciting cauſes of the diſeaſe are to be removed.

2, The collected fluid ſhould be evacuated.

3, The tone of the habit in general, and of the abſorbent ſyſtem in particular, is to be reſtored, by the exhibition of bitters, cinchona, preparations of iron, cold bathing, and moderate exerciſe.

The removal of the remote cauſes of the diſeaſe is to be accompliſhed by different remedies, ſuited to the nature of the exciting cauſe.

When the dropſy is the conſequence of an inflammation, the neutral ſalts, nitre, cream of tartar, and decoctions of dandelion, graſs, and parſley-roots, prove uſeful, ſuppoſing the patient to be young

young and of a vigorous conſtitution, and the inflammation to have been a true phlegmonic one. But if the patient be either of a relaxed habit, or of a more advanced period of life; or if the inflammation have been of an obſcure chronic kind, as is frequently the caſe in the dropſy of the thorax; the digitalis is the moſt powerful remedy to expel the ſerous collection; and afterwards the ſyſtem ſhould be ſtrengthened by bitters, bark, and ſteel, to prevent the water from accumulating again.

If the dropſy be produced by plethora diſtending the ſanguiferous veſſels beyond their tone, without any previous inflammation, the mild diuretics abovementioned will likewiſe prove uſeful: but veneſection, and a low vegetable diet, are generally to be combined with them; for if bleeding be neglected, though the dropſy may be cured, yet the patients frequently die of an apoplectic fit amid convulſions *. Such perſons very ſeldom ſtand in need of tonics. The dropſy originating from increaſed action does not bear the uſe of the ſquill, the tonic pills of Dr. Bacher †, colocynth, elaterium, jalap, ſcammony, and gamboge; they always make the diſeaſe worſe, and occaſion not unfrequently the death of the patient, on account of their violently operating on the ſyſtem.

From what I have ſaid, it is evident, that ſome modern authors have gone too far in aſſerting, that the dropſy in all caſes originated from a weakneſs

* Stoll, *Rat. Med.* pt. 3, ſect. iv, cap. vi, p. 203—214.

† Conſiſting of an ounce of extract of black hellebore, prepared in a very operoſe way, the ſame quantity of aqueous extract of myrrh, and ten ſcruples of powdered carduus benedictus.

and

and relaxation of the general habit; as in the inflammatory ſpecies a radical cure is often accompliſhed by bleeding and mild diuretics.

The dropſy owing to debility, which is much more frequent than the former, may be produced by a variety of cauſes, to the nature of which the treatment of the diſorder ſhould be adapted. If the morbid ſtate of the abdominal viſcera (obſtructions) be the exciting cauſe of the diſeaſe, it would be a fair caſe for giving the tonic pills of Dr. Bacher, were not the healing art provided with other remedies far more powerful than the incongruous and difficult preparation of theſe pills. Surely after modern chymiſtry has rendered medical gentlemen better acquainted with the conſtituent parts of the various preparations of the materia medica, no one, ſuppoſing theſe pills were really of ſome utility, would prepare them according to the preſcription of their author. But at preſent it is clearly proved by experience, that the volatile part of the black hellebore, merely to deſtroy which the doctor recommends this expenſive preparation, is not only harmleſs in thoſe caſes, in which the uſe of the black hellebore is adviſable, but alſo greatly contributes to the cure of the diſeaſe. It is true Dr. Bacher has written, that great benefit was to be derived from his pills by their operation both by ſtool and urine, but unfortunately theſe effects have not been ſupported by experience. Quarin, who has had frequent opportunities of trying theſe pills, records, that during their uſe the patients became very often coſtive; and that they experienced much more benefit from the infuſion of the black

hellebore

hellebore joined with bitters, or from it's extract, than from the tonic pills of Dr. Bacher *. I have pretty often ſeen theſe pills given in almoſt every kind of dropſy both of the thorax and abdomen, but I never knew a ſingle patient recover by their uſe. In moſt caſes coſtiveneſs was the only effect to be obſerved from them; and though in ſome inſtances the ſecretion of urine was increaſed, and the patients ſeemed to experience ſome relief, yet the benefit was only temporary, and afterwards the diſorder grew worſe. Therefore as theſe pills are much more expenſive than the other preparations of black hellebore, and are very uncertain in their operation, they juſtly deſerve to be rejected, and aperients of the ſtimulating kind, ſuch as the gums, bitters, and the decoction or extract of the black hellebore, ſhould be ſubſtituted in their ſtead. If from hard drinking, as an alteration in the ſtructure of the meſenteric glands, and a chronical inflammation of them, are moſtly combined with it in theſe caſes, together with a relaxation of the general habit, the complaint is very ſeldom cured. Strongly ſtimulating remedies prove generally pernicious: the cooling aperients, mild diuretics, mercurius dulcis, a nouriſhing diet, a moderate uſe of wine, and exerciſe on horſeback, are to be recommended, in order, if not to cure, at leaſt to palliate the diſeaſe. Dropſy for the moſt part originates from a morbid ſtimulus, diſturbing the action of the lymphatic ſyſtem. This ſtimulus ſhould be removed; and, if we be unacquainted with it's nature, diuretics, joined with antiſpaſmodics and opiates,

* *Animad. pract. in Diver. Morb.* cap. viii, p. 109 & ſeq.

are

are to be given. If from repelled cutaneous eruptions, camphor, Dover's powder, antimonials, and the dulcamara, are the moſt efficacious remedies. If from ſuppreſſed perſpiration, diaphoretics, diuretics combined with opiates, and bliſters, uſually accompliſh the cure.

But though no doubt in dropſy, as in all other maladies, the practitioner ought to pay the ſtricteſt attention to the exciting cauſes in the treatment of the diſeaſe; yet it is to be obſerved, that the remote cauſes of dropſy are very often ſuch as have been removed long before the diſorder came on. For inſtance, when the dropſy happens after large evacuations of different kinds, but eſpecially after hemorrhages, or after long protracted fevers, though the cauſes have ceaſed to act, ſtill their effect, the dropſy, remains, in conſequence of the debility and relaxation of the general habit produced by them. The dropſy likewiſe originates not unfrequently from certain diſeaſes preceding it; the curing of which is always a matter of difficulty, and requires ſome length of time. Now though it is a fact, that a radical cure cannot be obtained but by the remedies particularly adapted to the morbid ſtate, of which the dropſy is the effect, and is to be deſpaired of without the removal of this ſtate, yet it is evident, that nothing can be done for the radical cure of the diſorder, previous to the evacuation of the ſerous collection; for the urgent ſymptoms not only often require immediate relief, but the remedies by which the radical cure is to be attempted frequently cannot effectually operate,

operate, before the water is discharged from the body.

The evacuation of the serous fluid is to be effected either by a chirurgical operation, or by the employment of emetics, drastic purgatives and diuretics, a great number of which are recorded by the various writers on the subject. But most of them are silent on the various circumstances, under which these different remedies are efficacious, and *vice versa* when they prove pernicious; though, as Cullen justly remarks, "none of them, especially of "the diuretics, are of very certain operation, neither "is it well known, why they sometimes succeed, "and why they so often fail; nor why one medi- "cine should prove of service, when another does "not; and that it has been generally the fault "of writers upon the practice of physic, to give "us instances of cases, in which certain me- "dicines have proved very efficacious, but neglect "to tell us, in how many other instances the same "have failed *." As this author, however, is as far from laying down any thing certain on the subject as the rest; and it is of the greatest moment in the dropsy, to distinguish well the circumstances under which different medicines are useful, from those under which they are pernicious; because neither in this malady, nor in any other, does a remedy exist, which can possibly be always attended with success; not to say, which does not hurry on the fatal termination of the complaint under some circumstances; I shall attempt, from a comparison of the observations of different practitioners on

* L. I. vol. iv, § 1684.

these

theſe medicines, and from my own experience, to lay down ſome general rules on the uſe of thoſe remedies, which are chiefly recommended for the evacuation of the accumulated ſerous fluid.

In attempting to evacuate the water, the practitioner ſhould always pay the ſtricteſt attention to adapt the remedy to the conſtitution. Hence, if the patient be of an irritable delicate habit, tenſe fibre, florid complexion, and warm ſkin, an aqueous ſolution of the cream of tartar, the decoctions of parſley root, dulcamara, graſs root, &c., generally anſwer the purpoſe. Upon this occaſion however I cannot help expreſſing ſome doubt as to the diuretic power of theſe remedies. I believe, that their efficacy is chiefly owing to the quantity of water given along with them; and I am very much diſpoſed to think, that upon trial they would hardly be found more powerful than drinking a large quantity of common water: for they prove ſucceſsful only in caſes, where the ſyſtem is ſuſceptible to ſlight ſtimuli; and in all others, where a ſtronger ſtimulus is requiſite to rouſe the abſorbents to action, they uſually fail; at leaſt they have invariably proved unſucceſsful in all other caſes, in which I have ſeen them uſed. If, however, the cream of tartar be combined with a fifth or ſixth part of borax, it ſeems then really to be a powerful diuretic. If the patient be of a phlegmatic temperament, lax fibre, pale countenance, of a cold white ſkin, with feeble, ſoft intermitting pulſe, the ſwelling of the abdomen ſoft to the touch, and the anaſarcous limbs readily pitting, recourſe ſhould be had to the foxglove. And ſurely under ſuch circumſtances this

remedy deſerves to be preferred to all others; for it conſiderably promotes both abſorption and the ſecretion of urine; is a diuretic the moſt certain in it's operation in the whole materia medica, operates quickly, brings on relief within a few days, and, under the ſtated circumſtances, has often proved ſucceſsful, where the ſquill, and the draſtic purgatives had failed. The digitalis is to be recommended likewiſe when the exciting cauſe of the dropſy is a ſcrofulous complaint; in which malady alſo it is found to be of the greateſt utility. But it is with the digitalis as with all other powerful remedies: though it affords a very efficacious mean of reſtoring health in the hands of a ſkilful practitioner, and adminiſtered in a cautious way, yet it operates like a poiſon, either when given in caſes in which it ſhould not be employed, when exhibited in too large a doſe, or when it's uſe is too long protracted. When too long continued, the foxglove proves very injurious both to the irritable parts and the nerves, and has a ſtrong tendency to weaken the ſight, and the powers of the ſanguiferous ſyſtem. It almoſt invariably renders the pulſe conſiderably ſlower, and even has ſometimes deſtroyed the patient by aboliſhing the circulation. This has alarmed ſome phyſicians ſo very much, as to induce them to write againſt the uſe of the digitalis, and to hold it up as a very unſafe and pernicious remedy, which of courſe ſhould be rejected. I can aſſert, however, from my own obſervation and that of other practitioners, that, by attending to the following rules in the exhibition of this remedy, the digitalis may be given, if not with ſucceſs, at leaſt without materially injuring the conſtitution of the patient.

Firſt,

Firſt, the doſe ought not to exceed two grains twice a day: for when given in a larger quantity it often does a great deal of harm; and when this does not bring relief, I never ſaw any benefit from uſing a larger doſe.

Secondly, the uſe of the digitalis is to be deſiſted from every ten or twelve days for a day or two, in order to give the ſanguiferous ſyſtem an opportunity of recovering it's ſtrength a little.

Thirdly, to moderate the effects of the foxglove on the irritable parts and the nervous ſyſtem, nervous remedies, as aſafœtida, caſtor, valerian, and ammonia, are to be combined with it.

Fourthly, though the doſe recommended will generally be born by the patients, yet they ſhould be carefully watched, in order to obſerve what effects the digitalis has on the circulation; for if the pulſe ſhould ſink very much under it's uſe, the doſe is to be diminiſhed. This caution I give, however, more to put practitioners on their guard, than from what I have obſerved myſelf. Though I do not queſtion, that this remedy, given in the common way, may ſometimes deſtroy the patient; having myſelf once been very near killing a woman, a patient of mine, with the foxglove; but I arrived time enough to prevent it's proving fatal, and the digitalis having emptied the patient, the return of the diſeaſe was happily prevented by bitters, cinchona, and chalybeates. Yet I never ſaw any alarming effect on the pulſe take place from digitalis, given with the cautions I have attempted

to recommend; and I believe the foxglove is as safe a remedy as any, if these rules be duly observed.

The squill may also be taken with hopes of success, nearly under the same circumstances, under which the digitalis has been recommended; but it neither brings on such speedy relief, nor is so certain in it's operation: though on the other hand the squill may be protracted during a longer space of time; and may be used on many occasions, when the digitalis would be improper; because the squill can be accommodated to various circumstances, by combining different remedies with it, and by this combination the disorders, which otherwise frequently accompany it's use, are for the most part prevented. Thus in persons whose *primæ viæ* are irritable, opium is to be combined with this remedy; if the system appear to be very much weakened, the bark, and other tonics, may be usefully joined with the squill; or if it should stimulate the patient too much, it's stimulating power may in some measure be diminished by the addition of nitre. The dose should be adapted to the constitution of the patient, and the symptoms of the disease. I have generally seen it attended with the most success, when given so as to excite a slight degree of nausea. This medicine, however, is not advisable in patients of a tender delicate constitution, of an irritable habit, of a tense fibre, and a tight cordy pulse, on account of it's high stimulating power. The squill is likewise not to be employed, when the dropsy originates from the morbid state of the abdominal viscera, commonly called obstructions

tions of the liver; for it excites a chronic inflammation of the veſſels by it's ſtimulating quality, and promotes it when already begun*. Laſtly, this medicine ſhould not be given in the inveterate dropſy, where the conſtitution is ſo much broken, that there are ſtrong apprehenſions of the patient's wanting ſtrength to evacuate the ſerous fluid by urine, on being duly ſtimulated by the ſquill; for this remedy, taken under ſuch circumſtances, does not in the leaſt promote the diſcharge of urine, but on the contrary increaſes the uneaſineſs of the patient.

If the dropſical patient be of an indolent habit, and of a flaccid fibre, and if with this inſenſibility there be ſtill left a ſufficient degree of ſtrength, emetics and draſtic purgatives ſhould be adminiſtered, to evacuate the water. Strong antimonial emetics ſhould be employed in this caſe, and repeated frequently at ſhort intervals. But though vomiting has ſometimes cured the diſorder in very robuſt habits, where the patient's ſtrength was not much impaired, and certainly claims a trial in the dropſy of the ovaries, which does not ſeem materially to interfere with the conſtitution; particularly as there are inſtances on record, that the diſeaſe in queſtion has been removed by a ſpontaneous vomiting†, and there is ſome reaſon to hope, that by the ſhock the general ſyſtem undergoes from the operation of a ſtrong emetic, the fallopian tubes may be ſtimulated ſo as to take up the water, and convey it to

* Murray, l. l. t. v, p. 98 & 99: Ludwig, *Adverſ. med. pract.* t. ii, p. 697 & ſeq.: and Quarin, l. l. cap. viii, p. 171 & ſeq.

† Quarin, l. l. cap. viii, p. 152.

the womb, where, by means of the vagina, it would be expelled from the body; yet upon the whole emetics are very unsafe remedies in the dropsy, and far inferiour in efficacy to the drastic purgatives. They ought therefore but rarely to be used, and never without caution, as on many occasions the patient has expired during the operation of vomiting.

Of the hydragogues, elaterium, gamboge, and colocynth are the chief. The former two I have often seen given with the utmost success in cold, indolent, phlegmatic habits; and Dr. Buchaave has frequently removed inveterate dropsies, obstinate to all other remedies, with a decoction of the latter *. But as even small doses of the colocynth not unfrequently excite sixty stools or more during the course of the day, this remedy, though seemingly the most powerful in it's operation, is more suited to answer the purpose in the strong hardy constitutions of sailors, soldiers, farmers, and common people, than in weak and more irritable persons. For though it likewise powerfully evacuates the water in these, yet it's violent manner of operating weakens the general habit so very much, that the patient not unfrequently sinks under the malady, and his fate is hurried on by the sudden evacuation of the water. Beside these hydragogues, scammony, jalap, and mercurius dulcis, given in such doses as to have a drastic quality, have often been found successful: though in general, I believe, they are not quite so powerful as the elaterium, gamboge, and colocynth. The drastics should be always combined with some

* *Act. reg. societ. med: Hafn.* vol. iii, cap. xii, p. 156 & 169.

aromatic,

aromatic, which greatly increaſes their action, and at the ſame time prevents the gripings of the bowels, with which otherwiſe their operation is generally attended.

In ſpeaking of diuretics I was ſilent reſpecting the colchicum autumnale, given in the form either of oxymel or of a decoction: for whatever has been ſaid by ſome authors as to it's efficacy in dropſy, I muſt acknowledge with Quarin, that in all the caſes in which I have ſeen it tried, it has invariably failed; and I am very much diſpoſed to think, that where it did prove ſucceſsful, the ſwallowing of a large quantity of water would have had the ſame effect.

In fine I muſt obſerve, that, though in general by uſing the above remedies, under the circumſtances I have attempted to point out, the collection of ſerous fluid may be evacuated, yet they are incapable of performing a radical cure; for, unleſs they accidentally operate on the cauſe of the dropſy, neither the cryſtals of tartar, digitalis, ſquill, nor hydragogues, do any thing more than palliate the diſeaſe by the evacuation of the water: and though you may empty your patients by them, yet the water accumulates again and again, and a radical cure is not to be obtained, but by the removal of the cauſe of the diſeaſe. Nay ſometimes the dropſy proves obſtinate to all the diuretics and hydragogues, and the water is only to be evacuated by remedies operating on the morbid ſtimulus exciting the diſeaſe; a remarkable inſtance of which I remember to have read in a certain periodical journal, where the dropſy, bidding defiance to all

the uſual remedies, was at laſt radically cured by the exhibition of the cicuta. In the inveterate dropſy, when the cauſe of the malady is not to be removed, and all that the practitioner can do is to render the condition of the patient as tolerable as the circumſtances will admit, by occaſionally emptying him by the means ſpoken of above, it will now and then be found, that the remedy, by which the water has been ſucceſsfully evacuated on former occaſions, afterwards fails, on account of the ſyſtem having become accuſtomed to it's ſtimulus, and that, to expel the collected fluid from the body, a freſh ſtimulus is wanting.

If the above medicines do not expel the water from the body, it ſhould be evacuated by chirurgical means. In anaſarcous caſes, inciſions in the extremities, or bliſters applied to them, will often relieve. In the aſcites and hydrops pectoris the collected fluid is to be drawn off by the paracenteſis either of the abdomen or of the thorax. In the firſt caſe the operation ſhould be performed a little below the navel, in the linea alba; not between the navel and the anteriour ſpinous proceſs of the ilium on the left ſide, as has been generally the cuſtom till within a few years, in order to avoid the wounding of the epigaſtric artery. In the ſecond the thorax ſhould be pierced near the ſpine, between the ſecond and third falſe ribs. The operation of the paracenteſis, which has often been very ſucceſsfully employed in an early period of the diſeaſe, is uſually deferred too long; ſince the viſcera undergo a morbid alteration in conſequence of their long ſoaking in the ſerous fluid, collected in the cavity either of the abdomen

abdomen or of the thorax; and a radical cure of the dropsy is to be despaired of in patients with a scirrhous liver, or diseased lungs.

The water being evacuated, either by medicines or by chirurgical means, to prevent a relapse, the tone of the general habit should be restored by bitters, bark, alum, chalybeates, cold bathing, nourishing diet, country air, and moderate exercise. But it is not to be understood, that the tonics are never to be given previous to the evacuation of the water; for in cases where evident tokens of a debilitated state of the system appear, it will often be useful, to combine the cinchona and various bitters with the diuretics from the very commencement of the disease. When the dropsy happens after a copious hemorrhage, or long continued fever, and the malady thus chiefly originates from the relaxed state of the general habit, those remedies, by which the body may be restored to it's due tone, as bitters, chalybeates, the gum-resins, bark, and opium, prove not only efficacious in effecting a radical cure, but are likewise the best calculated for carrying off the water. In the inveterate dropsy, when the constitution is almost entirely broken by the disease, the administration of diuretics and drastic purgatives would serve no other purpose but to hurry on the fate of the patient. In this unhappy state, the remedies, from which benefit is to be derived, are bark and opium given in large doses, camphor and nitre, and emulsions with asafœtida and camphor; by the use of which I have sometimes seen a considerable discharge of urine promoted, after diuretics and drastic purgatives

had been tried in vain. Even in leſs urgent caſes the practitioner will ſometimes experience, that, during the uſe of diuretics or draſtic purgatives, the patient becomes ſo much reduced in his ſtrength, as to render it neceſſary to deſiſt from them for a few days, and in the mean time to recruit the conſtitution a little by tonics, in order to enable the patient to bear their operation. In moſt caſes, however, the tonics prove the moſt powerful, when the collected fluid has been previouſly evacuated.

When the dropſy terminates fatally, it often deſtroys by bringing on a hectic fever. A diarrhœa, ariſing towards the end of the diſeaſe, not unfrequently carries off the patient by deſtroying the remains of the vital powers. The dropſy of the thorax often kills unawares by ſuffocation; though ſometimes the ſtagnant water becomes acrid, and excites a peripneumony, terminating in phthiſis. In the dropſy originating from an increaſed action, death is uſually brought on by an apoplectic fit, and the patient expires amid convulſions. Laſtly, in an inveterate dropſy ariſing from debility, ſo many functions become injured, that it is abſolutely impoſſible to determine accurately what occaſions death; and it is more than probable, that the cauſe of death in ſuch caſes is very complex, and to be derived from the injured functions of different organs: ſometimes, however, the patients fall into convulſions, in which they expire; at other times an apoplectic fit puts an end to life.

ORDER

ORDER III.

Debilities and Privations.

GENUS I.

Scrofula.

The ſcrofula is a ſwelling and chronical induration of the lymphatic glands, probably originating from a chronic inflammation, which they have undergone in conſequence of a peculiar morbid condition of the abſorbent ſyſtem, and moſtly attended with a peculiar countenance and ſtate of the general habit.

The diſeaſe ſeldom appears before the ſixth month, and does not very often begin after the tenth year of the child's age; though I have ſeen inſtances of children of only three months labouring under the diſeaſe, and others, where the diſeaſe did not make it's appearance till the age of puberty. The ſcrofula attacks two very different ſets of children, one of an irritable delicate complexion, the other of a cold phlegmatic diſpoſition.

The chief appearances of the diſeaſe are a ſoft and flaccid habit, a ſmooth ſkin, roſy cheeks, a tumid upper lip with a chop in it's middle, the columna naſi and lower part of the noſtrils often likewiſe tumid, blue eyes, ſoreneſs and ſmall ulcerations of the eye-lids and noſtrils, the pupil for the moſt part dilated, the cheeks appearing turgid towards the ears, the jaws uſually broad, the neck ſhort,

and the abdomen hard and ſwelled; with which phenomena, when the malady more manifeſtly ſhows itſelf, enlargements of the lymphatic glands about the neck and under the jaws, and vague febrile movements are generally combined.

The cauſes, which bring on this diſeaſe ought to be divided into the prediſpoſing, and the exciting. The former are,

1, An hereditary diſpoſition; when children are born either of ſcrofulous parents, or of cachectical parents, weakened by the lues venerea, or any other diſorder. In either caſe, the character of this diſeaſe is often impreſſed, as it were, on their tender bodies; and experience proves, that when theſe unfortunate children arrive at a certain period of life, they are very often afflicted with the ſcrofula*.

2, A bad diet and regimen of life. For if the infants, inſtead of the milk of the mother, deſtined for their nouriſhment by nature itſelf, be ſtuffed up with farinaceous paps; if the tone of their ſolids be relaxed by the frequent uſe of opiates; if crude glutinous food, ſuch as bread mixed with a great deal of bran, and potatoes, be given to them, on which food alone poor children in ſome countries are often obliged to live, and which their tender ſtomachs are, in general, unable to digeſt; if the children live a ſedentary life; if their *primæ viæ* become weakened by taking large draughts of warm water, or by any other means; it is not wonderful,

* Cullen, l. l. § 1739: and Thueſſink, *in de voorreede voor de Verhandeling over de Ziekte der Watervaten van T. White*, p. 18 & 19.

that

that ſuch children, though perfectly ſound at their birth, ſhould contract the prediſpoſition to the ſcrofula; and even that, when this unwholeſome manner of living is perſiſted in, they ſhould afterwards contract the ſcrofulous diſorder itſelf.

It appears then, that children, though born of healthy parents, are nevertheleſs often afflicted with a prediſpoſition to the ſcrofula from an improper way of living; and on the other hand, where infants are born with ſuch a prediſpoſition, the impreſſed ſcrofulous character is not unfrequently aboliſhed by a proper diet, and manner of life, ſo that they remain free from this diſeaſe during their lives.

3, The climate and ſtate of the air ſhould not be omitted, in ſtating the prediſpoſing cauſes of the ſcrofula; as theſe alſo contribute greatly to it's generation. Accordingly, ſcrofulous diſorders are of moſt frequent occurrence in temperate climates; while they are but ſeldom obſerved in extremely hot or extremely cold regions; and they do not even afflict all temperate regions in the ſame degree; but the more the air of any country is damp and foggy, and the more it experiences ſudden changes from hot to cold, and *vice verſa*, the more liable are it's inhabitants to ſcrofulous complaint. Hence in England, Ireland, Holland, and the lower parts of Germany, no malady is of more frequent occurrence.

The prediſpoſing cauſes are excited to act by morbid ſtimuli affecting the prediſpoſed abſorbent ſyſtem

ſyſtem in a ſpecific way; and the occaſional cauſes are the following.

1, The evolution itſelf of the body: for I have above proved, that no life can exiſt without a ſtimulus, and that the whole evolution is accompliſhed by means of ſtimuli; whence it is eaſy to be underſtood, why, at certain periods of life, when all the organs are, as it were, animated anew, this increaſed ſtimulus proves morbid, or an exciting cauſe to the weakened lymphatic ſyſtem, by the concurrence of which with the morbid prediſpoſition the ſcrofula itſelf is produced.

2, The time of the year. When the vital principle is excited by the ſeaſon, the increaſed action of the ſolids alſo frequently furniſhes an exciting cauſe of the ſcrofula: hence this complaint ſo often firſt appears in the ſpring, or in the commencement of the ſummer.

3, External violence, imperfect criſes of acute diſeaſes, metaſtaſis of any exanthematous diſtemper, in a word, all morbid ſtimuli whatever, afford occaſional cauſes; and therefore the ſcrofula frequently appears after the ſmall pox, the meaſles, and the ſcarlet fever*.

As thus all the prediſpoſing cauſes of this diſorder produce a debility of the lymphatic ſyſtem, and the exciting cauſes operate by preternaturally

* Hufeland, l. l. p. 49: & Leurs, *Pryſverhandelingen van het heelkundig Genoodſhap te Amſterdam*, t. ii, p. 18 et ſeq.

ſtimu-

ſtimulating the lymphatics, the nature of the ſcrofula is hence manifeſt, and Hufeland has juſtly ſtated the proximate cauſe of this diſeaſe to conſiſt in a debility, combined with too great irritability of the lymphatic ſyſtem *.

This is farther demonſtrated by the following conſiderations.

1, Infants and women, who, in general, ſurpaſs men in delicacy and irritability, are moſt liable to the ſcrofula.

2, The whole exteriour of ſcrofulous patients is eaſily diſtinguiſhable from all others by it's laxity and apparent turgidity.

3, Tonics often alone effect a cure; and at leaſt the ſcrofulous prediſpoſition can never be removed, without having recourſe to tonics †.

4, The ſymptomatical ſcrofula often appears after the application of ſtimuli, by which the irritability of the lymphatic ſyſtem is increaſed; for the ſpurious ſcrofulous tumours are not unfrequently obſerved after the inoculation of the ſmall-pox, after the communication of any poiſon, and even after inſerting a ſeton, or making an iſſue.

* L. l. ſect. 1, chap. 3, p. 58.

† See *Medical Obſ.* and *Inq.* vol. i, chap. xii, p. 184, chap. xxv, p. 303, and vol. ii, chap. xx, p. 365; where the illuſtrious Fothergill demonſtrates the great utility of the bark in this diſeaſe, and proves by many inſtances, that the bark alone is often ſufficient for it's cure.

5, The

5, The ſymptoms of ſcrofula are almoſt all to be conſidered as the effects of ſome ſtimulus *.

6, Medicines, which enervate the morbid ſtimulus, and diminiſh the irritability of the abſorbent veſſels, ſuch as mercury, and hemlock, often remove all the ſymptoms of the ſcrofula, though they do not deſtroy the prediſpoſition to this diſorder.

Thus the proximate cauſe of ſcrofula is to be looked for in the lymphatic veſſels, that is in the ſolids; and the fluids are only to be conſidered as the cauſe of this diſeaſe, ſo far as they ſtimulate the veſſels, and excite their reaction. In other words, the fluids may act as an occaſional cauſe on the prediſpoſed ſolids, when, on account either of the impaired tone of the digeſtive organs, or of improper food, the chyle deviates from the healthy ſtate, and is vitiated both in quality, and conſiſtency: becauſe then the prediſpoſed ſolids, preternaturally affected by the vitiated lymph, undergo a certain morbid alteration, and are thrown into irregular motions; the conſequence of which is, that a ſpecific matter, called ſcrofulous, is ſecerned, which is afterwards depoſited by *metaſtaſis* at various parts, and there excites different ſymptoms, according to the different functions of the affected organs. Beſides, this matter is continually conveyed along with the chyle into the blood, infects the ſanguiferous ſyſtem, and thus at length a ſtate is produced, which is com-

* Hufeland, l. l. p. 62.

monly

monly known under the name of the ſcrofulous diatheſis.

The following effects are produced in conſequence of the ſcrofulous diſpoſition of the lymphatic ſyſtem.

1, The abſorbent veſſels ſpaſmodically contract themſelves at the ſlighteſt ſtimulus, and check the paſſage of the chyle, till this ſpaſm is remedied either by nature or by art. Thus a ſtop is put to the paſſage of the chyle by ſpaſmodic contractions of the abſorbents, owing to the too great irritability of the lymphatic ſyſtem; and by no means by a thick matter contained in their cavity. It is very improperly, therefore, that theſe conſtrictions are called by moſt phyſicians obſtructions. My worthy preceptor, the celebrated Brugmans, has often injected mercury into ſuch bodies through the tumid glands, with the ſame facility, as through thoſe, which are commonly ſaid to be free from all obſtruction *. The illuſtrious Soemmering likewiſe obſerves, that though theſe enlargements of the glands are commonly called obſtructions, yet it is by no means to be ſuppoſed, that, in reality, ſuch glands are impervious, and obſtructed; for that he generally found them pervious, at leaſt to mercury †. If however the ſcrofulous complaint be not cured, the indurated glands become by degrees more and more altered in their ſtructure, and, at laſt, their organical compoſition is entirely deſtroyed, and they

* Bernard, *Queſt. varii Argumenti*, l. l. cap. iv, p. 28.

† L. l. § 37, p. 90.

reſemble

reſemble a ſort of ſtony ſubſtance. This total deſtruction of their organical compoſition nevertheleſs but ſeldom happens; and when it does, ſtill it takes place only in ſome glands; and, as far as I know, there exiſts no inſtance of a body, in which all the glands of the meſentery were found to have undergone ſuch a complete degeneration.

2, The ſpaſmodic contraction of the abſorbent veſſels both produces irregular motions of the lymphatics, and puts a ſtop to the abſorption of the ſecerned fluids. Hence ariſe collections of a ſerous or watery fluid in different parts of the body, and preternatural dilatations of the lymphatics themſelves. From the ſame ſource is to be explained, why lymphatic tumours, œdemas, and hydatides ſo often accompany this diſeaſe.

3, The ſcrofulous diatheſis of the body is produced. For, as ſoon as the ſcrofulous character is once impreſſed on the conglobate glands, according to the rule of nature, that the effects are always in the compound ratio of the ſtructure of the affected part, and the applied ſtimulus, as long as this character is retained, theſe glands continually generate a ſcrofulous fluid, and impregnate the chyle with it. This humour thus impregnated, enters the blood, and being conveyed by the ſanguiferous veſſels to all parts of the body, at length infects the whole ſyſtem. For, as Dr. Kortum juſtly remarks, " though the " lymphatic ſyſtem conſtitutes the primary ſeat of " this diſtemper, and the ſcrofulous poiſon almoſt " always makes the firſt attack on the conglobate " glands, the ſcrofulous tumours are by no means

" con-

" confined to theſe alone: on the contrary, if the " diſorder increaſe, and become inveterate, the " conglomerate glands, and even the parts that are " not glandulous, are likewiſe afflicted *."

The ſcrofulous diatheſis of the body is productive of the following effects.

1, It not only ſtimulates the conglobate glands, and very often incites in them a chronical inflammation; but operates, beſides, on the nerves, the ſanguiferous ſyſtem, and the ſecerning veſſels. Hence the convulſions, feveriſh motions, and vitiated ſecretions, ſo frequently obſerved in ſcrofulous patients; and if the ſcrofulous matter be depoſited by metaſtaſis on any organ, as frequently happens, ulcers of the worſt kind, or caries of the bones, often ariſe in the affected part.

2, It produces in the lymph, and the other fluids, which paſs through the lymphatic ſyſtem, a tendency to ſpiſſitude; as is chiefly proved by the thick curdled matter, which is diſcharged from the tumours, occaſioned by a metaſtaſis of the ſcrofulous virus, when terminating in an ulcerating proceſs.

It is not to be underſtood, however, that the matter diſcharged by a ſcrofulous ulcer has been depoſited by metaſtaſis at the affected place; but the fluid conveyed to the affected part by the irregular motions of the lymphatics excites a ſpecific inflammation, in conſequence of which a ſpecific

* Soemmering, l. l. p. 86.

fluid is ſecerned, which partakes of the ſcrofulous character.

Beſide the effects here ſtated, Hufeland aſſerts, that the ſcrofulous diatheſis takes away the nouriſhing quality of the lymph, by reſolving this humour, and by deſtroying its nutritious particles; and this he aſſigns as the reaſon, why tabes always enſues from the ſcrofulous condition of the ſyſtem when not cured. This author thinks, likewiſe, that in ſcrofula a certain acid is evolved from the vitiated lymph: which opinion he attempts to juſtify by the ſour breath of the patients, their green or white ſtools, and an acid ſweat, with which they are ſometimes afflicted. Nay he goes ſo far as to ſay, that it is phoſphoric: ſince the experiments of Dr. Gærtner ſhow, that the urine of thoſe, who labour under ſcrofula, contains leſs phoſphoric acid than that of healthy perſons; and that when the morbid matter is diſcharged from the body by a ſort of criſis, phoſphoric acid is always found in a great quantity in the urine of the convaleſcent *.

With the greateſt deference to the abilities of this eminent practitioner, I muſt beg leave to make ſome remarks, on theſe ſuppoſed effects.

I doubt in the firſt place, whether the tabes might not be imputed with greater propriety to the alteration in the ſtructure of the ſolids, occaſioned by the continual operation of the morbid ſtimulus, than to a peculiar faculty of the ſcrofulous diatheſis to de-

* L. l. cap. 5, p. 90, et ſeq.

ſtroy

ſtroy the nutritious parts of the lymph; which, by the by, ſeems to be a mere hypotheſis, not in the leaſt founded on the ſymptoms of the diſeaſe: for why ſhould this reſolution of the lymph be requiſite; ſince the lymph itſelf, not properly aſſimilated by the degenerated glands, cannot afford a proper nouriſhment to the ſyſtem? With reſpect to the evolution of the phoſphoric acid from the lymph, I do not queſtion the veracity of Dr. Gærtner; but I cannot comprehend, how Dr. Hufeland can poſſibly prove, from the ſymptoms of the diſeaſe, or from theſe experiments, that an evolution of the phoſphoric acid, and an acid acrimony of the fluids, take place in this diſeaſe. For if it be true, that the ſecerned humours themſelves do not preexiſt in the blood, but are generated by a ſpecific power of the ſecerning organs, which Hufeland does not queſtion, then certainly the phoſphoric acid itſelf alſo does not preexiſt in the blood, but is formed in the kidneys themſelves. What more then can be concluded from the experiments of Dr. Gærtner, than this, that the ſecretion of the urine is likewiſe vitiated in ſcrofula? At leaſt the inference, that this acid, being retained in the blood, occaſions the ſcrofulous acrimony, cannot be drawn from theſe experiments. The acid perſpiration is by no means a conſtant ſymptom of the ſcrofula; for the moſt part it does not exiſt, and when the diſeaſe is attended with acid ſweats, theſe are to be explained from the ſecerning organs of the perſpirable matter being affected by the morbid ſtimulus. The ſour breath of the patients, their acid eructations, heart-burn, and green or white ſtools, likewiſe are nothing but the effects of the debilitated ſtate of the digeſtive organs, the

tone of which is always conſiderably weakened in in this diſeaſe. Therefore, though in ſcrofula, in conſequence of the previous altered ſtate of the ſolids, the fluids undergo likewiſe a ſpecific change, yet this alteration of the fluids is by no means to be compared with an acid acrimony, the exiſtence of which Dr. Hufeland wiſhes to prove.

The prognoſis of ſcrofula greatly differs, according to the conſtitution of the patients, according to it's complication with other diſeaſes, and according to the different ſtages of the diſorder. In general, the greateſt hope of cure may be entertained, when the ſcrofula is not complicated with any other diſeaſe, and when the diſeaſe is not very inveterate: though even in theſe caſes the cure is very ſlow and tedious; chiefly becauſe the moſt powerful medicines generally do not afford the leaſt benefit, if the patient, in ſpite of the precepts of his phyſician, neglect a proper regimen of diet. If a hectic fever have already been brought on by the long continuance of the diſeaſe, or the ſcrofula be complicated with other diſeaſes, the prognoſis is by no means ſo favourable. Still, however, the patient may be cured in the commencement of the hectic fever: but if it have already continued for a long time, and the ſolids, eſpecially the meſenteric glands, have undergone a conſiderable alteration in their ſtructure, the malady, for the moſt part, bids defiance to all remedies, and terminates fatally. If the ſcrofula be complicated with other diſorders, it threatens more or leſs danger, according to the different compli-

cation.

cation. Upon this occaſion I muſt ſtate a cautionary remark.

When the ſcald head, or other ſcrofulous eruptions, appear on the ſurface, theſe ſhould by no means be repelled by external applications alone; ſince frequently great miſchief is occaſioned by their retropulſion. I ſaw once, from a repelled ſcald head, an epilepſy brought on, which proved obſtinate to all remedies; till at laſt, the true cauſe of the diſeaſe being diſcovered, the phyſician preſcribed æthiops antimonalis along with a decoction of the woody-nightſhade, during the uſe of which the ſcald head again appeared, and the epilepſy was removed.

With regard to the treatment of the ſcrofula, the radical cure of the diſeaſe is always difficult, and in general very ſlowly accompliſhed. Cullen goes ſo far as to ſay, "that we have not yet learned any "practice, that is certainly or even generally ſuc-"ceſsful in the ſcrofula *." From a great number of ſcrofulous caſes I have had an opportunity of obſerving, I am however perfectly ſatisfied, that the ſcrofula, when it has not proceeded too far, in moſt caſes yields in time to the power of phyſic, if it be properly treated, and a ſuitable regimen be adopted in conjunction with the medical treatment. The general indications for the cure of the ſcrofula are the following.

1, The remote cauſes of the diſorder, when ſtill exiſting, ſhould be removed. For if theſe be

* L. l. vol. iv, § 1753.

ſuffered to remain, the ſcrofula bids defiance to all remedies.

2, The morbid irritability of the abſorbent ſyſtem is to be diminiſhed; the diſpoſition of the lymphatic glands to ſecern a ſcrofulous fluid ſhould be removed; and the ſolids diſpoſed in ſuch a manner, that the morbid matter be conveyed by the *natura medicatrix* to various emunctories, and thus diſcharged from the body. This indication is anſwered by remedies, which either operate with a ſpecific ſtimulus on the abſorbent ſyſtem, or, deſtroy the ſcrofulous action by exciting other motions in the general habit, or which put a ſtop to the irregular motions of the lymphatics by their antiſpaſmodic quality; or which check the too great irritability of the abſorbents, and enable the *natura medicatrix* to get rid of the morbid ſtimulus by reſtoring the habit in general, and the *primæ viæ* and the lymphatics in particular, to their due tone. Hence ſtrengthening remedies are frequently the beſt calculated for removing the irregular motions of the abſorbent ſyſtem, becauſe it's morbid irritability often originates from weakneſs. For the reſt, mercurials, antimonials, cicuta, murias barytæ, murias calcis, burnt ſpunge, opium, aſafœtida, the reſolvents*, belladonna, dulcamara, guaiacum, abſorbents,

* I here make uſe of the word reſolvents, becauſe, though incongruous, it has hitherto been commonly employed as a technical term; and, by no means, becauſe theſe medicines really operate by a reſolving quality: for I have above proved, that no obſtruction exiſts, what therefore can they reſolve? It is, beſides, highly probable, that theſe medicines act in a quite different

ſorbents, and the expreſſed juice or a ſtrong decoction of colts-foot, anſwer beſt theſe purpoſes.

3, During the whole courſe of the diſeaſe emetics and purgatives ſhould occaſionally be employed to keep the *primæ viæ* clear, which are always diſpoſed to collect ſordes in this diſeaſe.

4, The general habit and the lymphatic ſyſtem ſhould be ſtrengthened by cinchona, the bark of the white willow, gentian, preparations of ſteel, bitters, myrrh, nouriſhing diet, country and ſea air, moderate exerciſe, the cold bath, and ſea bathing. The due obſervance of this indication is of the greateſt moment in the treatment of the ſcrofula: for, this being neglected, a radical cure cannot be obtained; and though ſometimes all the ſymptoms of the diſeaſe may be removed by other remedies, yet, if tonics be not given, the prediſpoſition of the convaleſcent to the diſorder remains, and in moſt caſes the ſcrofula, ſooner or later, makes it's appearance afreſh.

The compaſs I propoſe to this work does not permit me ſeparately to inquire into the nature of the remedies recommended, and in what caſes each of them ſhould be employed. I am the more

ferent way, from what is commonly believed. Calomel, for inſtance, is called by every one a very powerful reſolvent; but does this medicine operate in the inflammations of the liver, in tetanus, in hydrophobia and in other ſpaſmodic diſeaſes, by it's reſolvent quality? By no means. On the contrary, I am ſtrongly diſpoſed to believe with Richter, l. l. page 276, that it operates by an alterant, antiſpaſmodic, and ſedative virtue.

juſtified in diſpenſing with this inquiry, as Huſeland has fully treated on this ſubject in his late excellent work on ſcrofula: ſo that I ſhall content myſelf with mentioning what remedies I have ſeen attended with the moſt ſucceſs in ſcrofulous caſes, and with laying down ſome general rules, to which careful attention muſt be paid by the practitioner, if he would be ſucceſsful in treating this diſeaſe. The remedies from which I have either myſelf experienced benefit, or which I have ſeen employed with advantage by others, are mercurius dulcis, crude antimony, ſulphur auratum antimonii tert. præcipit. flores ſulphuris, rob ſambuci, cicuta, opium, aſafœtida, dulcamara, digitalis, the expreſſed juice or decoction of colts-foot, the terra foliata tartari, ſpiritus Mindereri, rhubarb, tartarus tartariſatus, extractum graminis, taraxaci, ſoda, ammonia, jalap, aloes, gum galbanum, myrrh, bark, gentian, ſarſaparilla, preparations of ſteel, and mineral waters. The belladonna I never ſaw tried in ſcrofula. The burnt ſpunge I have ſeen given in ſeveral caſes with ſucceſs; but it is to be uſed with caution in perſons of a tenſe fibre and delicate conſtitution, eſpecially in thoſe, who are diſpoſed to conſumption; as, on account of it's ſtimulating quality, it frequently gives riſe to hemoptyſis, and chronic inflammation of the lungs. The murias calcis alſo I have never ſeen uſed; but from lime-water I have in ſome caſes experienced a great deal of benefit. The terra ponderoſa ſalita is very much recommended by Hufeland; but in the few caſes in which I ſaw it given, it invariably failed. Guaiacum I never ſaw tried in this diſeaſe. It needs ſcarcely to be obſerved,

that

that theſe different remedies are not indiſcriminately to be uſed, but ſhould be adapted to the conſtitution of the patient and the ſtage of the diſeaſe.

With regard to external applications, the diſcuſſion of ſcrofulous tumours on their firſt appearance may ſometimes be accompliſhed by the volatile and ſaponaceous liniments, mixed occaſionally with camphor and Barbadoes tar, and by mercurial ointments. As the ſcrofulous ulcers depend upon the general morbid diatheſis of the ſyſtem, it would be in vain to attempt their cure by topical remedies; and their healing up would be unſafe, as in this caſe the diſeaſe is often tranſlated to ſome internal organ. The applying of ſimple ſaturnine dreſſings, therefore, is in general all that ſhould be done: but when the complaint attacks any of the large joints, the ulcers become ſwelled and painful, and the diſcharge thin and acrid, the ſavine ointment I have in ſeveral caſes ſeen applied with advantage. In caſes of ſcald head, and other cutaneous eruptions of the ſcrofulous kind, the affected parts are to be well waſhed four or five times a day with a lotion, conſiſting of a few grains each of verdigriſe and hydrargyrus muriatus diſſolved in water; or what is ſtill better, cloths dipped in it ſhould be applied to the parts. The proportion of verdigriſe and ſublimate is from a quarter of a grain to a grain of each to an ounce of water, more or leſs, according to the age and ſtrength of the patient. With this lotion I have cured about forty children with ſcald heads; and I never found it fail, except in two farmers ſons, one ſixteen, the other

other twenty years of age, in whom the diſorder was of many years ſtanding; and in theſe I had afterwards recourſe to the unguentum citrinum, but in vain. In all ſpecies of herpes, and in all cutaneous eruptions of the ſcrofulous kind, I have ſeen uſed with advantage either the above lotion, or the hydrargyrus muriatus diſſolved in Goulard's water, with the addition of tincture of opium, in caſes where the eruption was painful; the unguentum hydrargyri nitrati mitius of the New London Pharmacopœia, either alone or mixed with an equal quantity of unguentum nutritum I have likewiſe found very uſeful; eſpecially in caſes which partook more or leſs of the nature of the itch. But none of theſe external applications ſhould ever be uſed, without giving medicines at the ſame time inwardly, in order to prevent a tranſlation of the diſeaſe to ſome internal organ. The ſpeedineſs of the cure depends upon the more or leſs inveterate ſtage of the diſeaſe, and a due attention to cleanlineſs.

In treating the ſcrofula the following general rules ſhould be obſerved.

1, As in the ſcrofula the *primæ viæ* are always apt to be filled up with ſordes, on account of the digeſtive organs not properly performing their function, it may be ſafely laid down as a general principle, to begin the cure of the diſeaſe by cleanſing the alimentary canal effectually, by a vomit, and a purgative of rhubarb and calomel, which will be found to aſſiſt very much in the removal of the diſeaſe.

2, That

2, That there exiſts no ſpecific againſt the ſcrofula, but that very different medicines ſhould be uſed according to the different ſtage of the diſeaſe, it's different complications, and the different conſtitutions of the patients. To all theſe circumſtances the ſtricteſt attention ſhould be paid, for the ſame remedy, which effects a radical cure in one caſe, often does a great deal of harm in another.

3, As the ſcrofula is a malady, the cure of which is always very ſlowly performed, the remedies ſhould from time to time be changed; becauſe the ſyſtem frequently becomes habituated to the ſtimulus of a remedy when uſed for ſome time, and requires another to be properly ſtimulated. It is not to be underſtood, however, that the practitioner, after having given a remedy for a few days without any perceptible benefit, ſhould directly have recourſe to another; for patience and conſtancy are to be ſtrongly recommended both to the patient and the phyſician, the diſorder very often ſhowing no ſenſible alteration during the firſt few weeks of the treatment. But what I wiſh to expreſs is this, that, when any remedy, after having operated evidently on the ſyſtem, ſeems to loſe it's efficacy, and the diſorder, as it were, ſtands ſtill, another ſhould be adminiſtered in it's ſtead, in order to rouſe the body out of it's dormant ſtate.

4, The practitioner ſhould carefully diſtinguiſh between the remedying of the local ſymptoms of the ſcrofula and it's radical cure; and by no means leave off the uſe of medicines at the diſappearance of the local ſymptoms: for though theſe are entirely

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removed, ſtill the prediſpoſition to the ſcrofula may remain; and unleſs this alſo has been removed by ſtrengthening the body by the uſe of tonics and a nouriſhing diet, as ſoon as the prediſpoſition is called into action by any morbid ſtimulus, the ſcrofula appears afreſh.

5, As a certain degree of debility is always combined with ſcrofula, and even the morbid irritability of the lymphatic ſyſtem not unfrequently originates from this ſource, it will often be found uſeful, from the very commencement of the diſeaſe, to combine tonics with the reſolvents, as they are commonly called, and thus to ſatisfy the ſecond and fourth indications at once.

6, A proper diet and way of life are of the greateſt moment in the ſcrofula; indeed all medicines are of no uſe without them, and it would be more eaſy to cure a ſcrofulous patient merely by a ſuitable diet and manner of living, without any medicine at all, than to perform the cure by the moſt powerful articles of the materia medica, without paying due attention to the regimen. To the re-eſtabliſhment of health a ſimple diet, chiefly animal, of eaſy digeſtion, moderate exerciſe, mineral waters, country and ſea air, cleanlineſs, cold and ſea-bathing, will be very conducive. When the patients are extremely weak, however, they uſually do not bear the cold bath, before their ſtrength is a little recruited. In theſe caſes the tepid bath ſhould be uſed in it's ſtead.

By

By obſerving theſe rules, and by the uſe of the remedies we have attempted to recommend, the ſcrofula will generally be found to yield by degrees to the power of phyſic. Sometimes, however, the diſeaſe baffles the moſt ſkilful treatment, and, after it has continued for ſeveral years, it is ſpontaneouſly cured by the changes the conſtitution undergoes at the period of puberty. In theſe caſes all that art can do, is to watch the diſeaſe, to palliate it's ſymptoms, and to check as much as poſſible it's progreſs.

If all the endeavours of phyſic prove fruitleſs, which is frequently the caſe, when the phyſician has not been called in till the inveterate ſtage of the diſorder, the ſtate of the patient grows worſe and worſe, and the diſeaſe ſooner or later terminates fatally. Such patients are deſtroyed in three ways.

1, By the dropſy: which is occaſioned either becauſe the abſorption of the ſecerned matter is checked for a long time by the ſpaſmodic conſtriction of the lymphatics, or becauſe a ſerous fluid is depoſited in ſome cavity of the body by their irregular motions.

2, By the tabes meſenterica: in which caſe the glands become daily more and more indurated, and their organic compoſition is gradually deſtroyed; a hectic fever is brought on; and by this the patients are carried off.

3, A tranſlation of the diſeaſe happens to the lungs, terminating in a fatal conſumption.

GENUS

GENUS II.

The Rickets.

The diſeaſe called the rickets is a morbid ſtate, taking place peculiarly in children, by which the bones, having loſt their firmneſs, become incurvated.

The diſorder ſeldom appears before the eighth or ninth month, and rarely begins after the third year of the child's age. The rachitic commonly have a very good underſtanding, and a premature ſenſibility; ſometimes however the faculties of the mind are impaired, and ſtupidity or fatuity prevails. The ſymptoms of the diſeaſe are, a lax habit; a flaccidity of the fleſh, the body at the ſame time becoming leaner, and the abdomen hard and tumid; a pale countenance with occaſional fluſhings of the cheeks; a head preternaturally large with reſpect to the body, in particular the forehead being unuſually prominent; the fontanella more open than uſual in children of the ſame age; the proceſs of dentition very ſlowly performed, and much later than uſual; the teeth in many caſes turn black, and decay; the ribs loſe their convexity, and become flattened on the ſides; the ſternum is puſhed outward; the epiphyſes at the ſeveral joints of the limbs grow large, while the limbs between the joints are more ſlender and flaccid; the bones increaſe in ſize, but ſeem to be every where flexible, and become variouſly diſtorted, eſpecially

eſpecially the ſpine of the back, and the child waddles in it's motion. The appetite is generally good, but the ſtools are frequent and looſe. Febrile ſymptoms come on; which, when the diſeaſe is not remedied, either by nature or by art, terminate in a hectic fever: a confirmed atrophy takes place: and death cloſes the ſcene.

The prediſpoſing and exciting cauſes of this diſorder are ſimilar to thoſe of the ſcrofula: for in the rickets, as in the ſcrofula, an hereditary prediſpoſition to the diſeaſe is obſerved, if the parents be either cachectic or weakened by any diſorders: in the former, as in the latter, the prediſpoſition may be removed by a proper regimen; as, on the contrary, ſound infants may contract the prediſpoſition to the rickets, as well as to the ſcrofula, by a bad manner of living and diet: and laſtly, the ſame climate, and ſtate of the air, which favour the prediſpoſition to the one diſeaſe, promote likewiſe the prediſpoſition to the other, and both diſeaſes equally afflict the ſame countries.

The evolution of the body itſelf often operates as an exciting cauſe; ſince the natural ſtimuli, when ſlightly increaſed, are frequently ſufficient to rouſe the morbid prediſpoſition in the delicate and irritable bodies of infants. Hence the rickets very often ſhow themſelves at the period of dentition; though a bad regimen is, for the moſt part, the exciting cauſe to the prediſpoſed ſolids. In like manner the ſmall-pox, the meaſles, the hooping-cough, or ſome other diſeaſe, often concurs in the generation of the

rickets; and this diſorder frequently ſucceeds them very quickly *.

As the ſame cauſes, when applied under the ſame circumſtances, always produce the ſame effects, and the remote cauſes of the rickets are the ſame as thoſe of the ſcrofula, it follows of courſe, that the nature of both diſeaſes muſt be ſimilar, though not entirely the ſame, becauſe, as they are not communicated under the ſame circumſtances, each affords different ſymptoms. Thus the nature of the rickets alſo conſiſts in the debility of the lymphatic ſyſtem, combined with it's increaſed irritability. The diſorder differs from the ſcrofula, however, in degree; ſo that the debility of the lymphatic veſſels ſeems to be greater, and their irritability leſs, in proportion to the age, than in the ſcrofula. Indeed, that the nature of the rickets is ſimilar to that of the ſcrofula, the following arguments prove beyond all doubt.

1, Children, whoſe bodies are very delicate and irritable, are uſually the only ſufferers by this diſeaſe. Now "the lymphatic ſyſtem is by far the "weakeſt of all the parts of the infantile body, and "at the ſame time the moſt irritable: on the other "hand, the functions of this ſyſtem are of much "greater moment in children, than in adults; for "the former much more need nutritious particles

* Buchan, l. l. p. 651: Roſenius a Roſenſtein *de Morbis Infantum*, cap. xxiv, p. 142: Stoll, *Prelect. in divers. Morb. chron.* cap. ii, p. 22: and Veirac *Verhandeling over de Engelſche Ziekte*, p. 57, 141, et 147.

than

" than the latter, who only want the reparation of " their losses*." It is of course not to be wondered at, that the young should be often afflicted with disorders of the absorbent system.

2, The general laxity and debility of the system in the rickety afford another proof of the truth of this opinion.

3, The efficacy of such remedies, as strengthen the habit in general, and the chylopoietic organs in particular, in the cure of this malady, is another unequivocal test. Tonics alone for the most part perform the cure; and though without their use the symptoms of the disease may indeed sometimes be removed, yet the disorder itself can by no means be radically cured.

4, That the irritability of the lymphatic system is also preternaturally increased in the rickets, not only appears from the symptoms of the disease, most of which are to be considered as effects of some stimulus; but also from the efficacy of such medicines, as deaden the noxious stimulus, in palliating the disorder: such as soda, and the absorbent earths, which almost always effectually remove the symptoms of this disease.

5, Cullen has observed, that children born of scrofulous parents are afflicted with the rickets more than others†. Dr. Kortum remarks, that

* Soemmering, l. l. § xxxvii, p. 93.

† L. l. vol. iv, § 1722, p. 354.

the one diſeaſe frequently terminates in the other*: and I have often ſeen the ſcrofula in children, who before had laboured ſeverely under the rickets: an evident token, that the greateſt affinity exiſts between the two.

6, It is proved by the diſſections of thoſe who have died rachitic, that the ſeat of the complaint is in the lymphatic ſyſtem, for in ſuch bodies the liver is always increaſed, and the ſpleen and the other viſcera are, for the moſt part, both in ſize and weight. The lymphatic veſſels appear of a greater diameter than uſual; the glands of the meſentery are always enlarged, ſometimes they are found indurated; nay ſome of them not unfrequently appear to have undergone a total deſtruction of their organic compoſition†; which evidently ſhows, that the primary ſeat of this diſorder is to be looked for in the abſorbent ſyſtem, and eſpecially in the lymphatic glands.

Thus it is evident, that the proximate cauſe of the rickets is by no means, as the framers of the humoral pathology have not heſitated to aſſert, an acid acrimony, which, being abſorbed by the lymphatic veſſels, and carried into the blood, produces ſuch a morbid ſtate of the vital fluid, eſpecially of it's ſerous part, that the rickets are always generated in conſequence: but, on the contrary, this diſeaſe is produced, as often as the prediſ-

* Soemmering, l. l. p. 96.

† Van Swieten, l. l. T. v, § 1485, p. 595: Ooſterdyk, l. l. cap. lxxxix, § 3, p. 290: Veirac, l. l. § 80: and Ackermann, *Commentatio medica de Rhachitide.*

poſed

poſed abſorbent ſyſtem is excited by noxious ſtimuli, ſo that the lymphatic glands, having undergone a ſpecific alteration, ſecern a ſpecific morbid fluid partaking of the rachitic character. Beſide what I have already ſaid on the ſubject, the following remarks evidently prove, that the opinion of an acid acrimony is inconſiſtent with the obſervations of nature.

1, Some infants are attacked with the rickets, according to the teſtimony of Dr. Veirac himſelf, one of the chief advocates for an acidity of the fluids, without the leaſt mark of an acid in the *primæ viæ* having ever appeared in them*: and experience proves, that many children, who labour ſeverely under acidity in the *primæ viæ*, are never afflicted with this malady. It has been generally ſuppoſed, that a diſorder of the *primæ viæ* was always obſerved in the rickets previous to the affection of the meſenteric glands. This, however, is a miſtake, for the rickets ſometimes occur without any previous affection of the *primæ viæ*, and of courſe the derangement of the ſtomach cannot conſtitute the proximate cauſe of the diſeaſe.

2, The firſt ſymptoms of the diſeaſe ſhow only a debility, and laxity of the ſolids; and the alteration of the fluids is not to be obſerved, till the malady has grown inveterate, or exiſted for a conſiderable time.

* Roſenſtein, l. l. p. 155 & 156: Buchan, l. l. p. 653 & 654: & Cullen, l. l. vol. iv, p. 350.

3, Tonics, and even the cold bath, often perfectly cure the rachitic: on the contrary, the antacids have often not the leaſt effect without tonics, or at the utmoſt they remove only the ſymptoms of the diſeaſe.

4, Laſtly, even taking it for granted, that acidity of the *primæ viæ* is a conſtant attendant of the rickets, yet the ſymptoms of the diſeaſe cannot poſſibly be accounted for from this ſource. For the acid generated in the *primæ viæ* would by no means be taken up by the extremely irritable orifices of the abſorbents; and ſuppoſing it's milder and more dilute part to be at length abſorbed with the chyle, it would have undergone ſuch a change in it's paſſage through the lymphatic ſyſtem, that, when it entered the maſs of blood, it would not be capable of ſoftening the bones; not to mention, what effects an acid able to ſoften the bones would exerciſe on the abſorbent ſyſtem and the blood-veſſels. May it not likewiſe with propriety be aſked, why the acidity of the *primæ viæ* ſhould poſſeſs the power of producing the rickets in children alone, and not in adults? the more as in the oſteoſarcoſis, and in the higheſt degree of ſcurvy, the bones of adults become ſoftened; and the acid generated in their *primæ viæ* is on certain occaſions ſo ſharp, as to irritate the ſkin of the throat, and ſet the teeth on edge, without producing the leaſt effects on the bones.

The rachitic diſpoſition of the abſorbent ſyſtem produces the following effects:

1, The

1, The ſpaſmodic contraction of the lymphatic veſſels, and their irregular motions, impede the abſorption of the ſecreted fluids, and not unfrequently produce œdemas of the hand and feet, and even ſometimes a general dropſy; which ſymptoms, in the commencement of the diſeaſe, ſoon diſappear by giving emetics, by which the ſpaſm of the lymphatics is removed; their cauſe however remaining, the ſymptoms quickly return, and at laſt perſiſt, ſo that the patients are often deſtroyed by the dropſy.

2, The rachitic diatheſis itſelf is generated. For, as a fluid partaking of the rachitic character is continually ſecerning by the degenerated lymphatic glands, it mixes with the chyle, and is thus carried to the blood, which it likewiſe infects, and thus the rachitic diatheſis is produced.

The conſequences of this are the following:

1, It acts on the nerves, and impreſſes on them a very ſtrong propenſity to ſpaſm. Hence convulſions are ſo frequently met with in the rickets*: and even ſometimes this ſpaſmodic diſpoſition can never afterwards be aboliſhed, but this morbid irritability afflicts the perſons, who before were attacked with the rickets, during their whole lives. It exerciſes no leſs power on the ſanguiferous ſyſtem. The blood becomes thin, and improperly aſſimilated; the circulation is irregularly performed; and the vital fluid is carried in greater quantity to

* Veirac, l. 1. p. 209.

the internal organs, and leſs to the external parts *. This explains why in ſuch bodies the viſcera are always found increaſed both in ſize and weight, and the exteriour parts on the contrary emaciated. The vitiated blood ſtimulating the ſecerning organs in another manner, than in the healthy ſtate, the ſecretions become likewiſe depraved.

2, It produces in the lymph, and in the other fluids, which paſs through the lymphatic ſyſtem, a propenſity to ſpiſſitude; as is evident from the ſecretion of a thick curdled matter, which ſometimes appears at the joints, and is the effect of a ſpecific inflammation, which the affected parts have undergone in conſequence of a tranſlation of the diſeaſe to them †.

3, It gives to the ſanguiferous veſſels a greater capacity for caloric: that is, it affects them in a peculiar way, ſo that they attract a greater quantity of oxygen gas, and of the latent heat combined with it: for the ſingular phenomenon, that the bodies of the rachitic retain heat longer, and do not eaſily grow rigid after death ‡, ſeems to be owing to this faculty.

Beſide theſe effects, ſeveral phyſicians are of opinion, that an acid is evolved in this malady. They diſagree, however, as to it's nature: for ſome

* Veirac, l. l. §. 49, p. 58: and Cullen, l. l. vol. iv, p. 363.

† Veirac, l. l. p. 86, 90, & 129.

‡ Stoll, *Prælect.* in *Morb. chron.* vol. i, p. 21: Roſenſtein, l. l. p. 144: & Calliſen, l. l. t. ii, p. 650.

of

of them aſſert, that it is a vegetable acid; and others, on the contrary, that it is the phoſphoric: which ſufficiently ſhows on what poor grounds their opinion is founded. The arguments they uſe, to prove the exiſtence of this acid, are exactly the ſame as were refuted when on the ſubject of the ſcrofula. Thus there is no need to repeat them: and the leſs, as the whole hiſtory of the diſeaſe evidently proves, that the peculiar ſtate of the fluids in the rickets is neither acid nor alkaline.

The reaſon, why this diſtemper attacks infants alone, ſeems to be, becauſe the lymphatic ſyſtem in adult perſons very ſeldom experiences ſo great a debility and irritability as are requiſite to the diſeaſe: yet there are a few inſtances on record of adult perſons having ſuffered a ſoftneſs of their bones from a diſeaſe analogous to the rickets. This diſtemper in adults is called *oſteoſarcoſis*; the nature of which, as it is of rare occurrence, and ſuch bodies have ſtill more ſeldom been accurately examined, is hitherto not well aſcertained: but the analogy between the ſymptoms of the *oſteoſarcoſis*, and thoſe which accompany the rickets, ſeems to prove, that it's ſeat alſo is to be looked for in the lymphatic ſyſtem; and the more, as it is proved beyond all doubt by the diſſections of ſuch bodies, that the lymphatic glands, both of the meſentery and the viſcera, were enlarged and indurated in different perſons carried off by this diſorder *.

* L. L. Plank, *Commentatio de Oſteoſarcoſi*, Tubingen, 1782, p. 13 & 54.

The ſoftneſs of the bones in the rachitis has been explained by the ingenious Mr. Aſhley Cooper, lecturer on ſurgery at St. Thomas's Hoſpital, from this, that as all the conſtituent parts of the blood are to be found in the lymphatic ſyſtem, and the coagulable lymph is eſpecially formed by the lymphatic glands, the natural inference muſt be, that theſe, on account of being in a diſeaſed ſtate, are incapable of performing their function, and conſequently the ſyſtem is not properly nouriſhed. This explanation, though it ſufficiently accounts for the debility of the ſyſtem obſerved in this diſeaſe, yet ſeems in my opinion incapable of clearing the matter from all doubt: for the queſtion ſtill remains, why the bones become preternaturally ſoftened in the rachitis; while, on the contrary, in the ſcrofula, though the glands are likewiſe diſeaſed, the ſoftneſs of the bones does not ever occur.

Beſides, if we examine the bones of the rachitic, we ſhall find, that the change they have undergone is not owing to the want of earthy particles alone. For there exiſts a great difference between the rachitic bones, and thoſe which are ſoftened by being macerated in acids: as theſe become ſoft and flexible, on account of their earthy particles being taken up, without any other change; whereas the rachitic bones are not only ſoft, and yield even to a moderate preſſure, but likewiſe, on account of the abundance of animal matter, increaſe in ſize, and exhibit as it were a ſpongy maſs. I am therefore rather inclined to believe, that it is no want of nutritious matter which occaſions the ſoftneſs of the bones; but that the ſecerning veſſels, on account of their being ſpecifically altered, ſecern, inſtead of the uſual bony ſubſtance, a peculiar

a peculiar matter, incapable of being changed into bony ſubſtance. But as the oſſeous particles are continually withdrawn by the lymphatics, and the ſecerning veſſels, inſtead of ſupplying the bones with oſſeous particles, afford ſcarcely any thing but animal matter, the conſequence muſt be a preternatural ſoftneſs of the bones.

In fine, though it is very difficult to explain how it happens, that ſome rickety perſons poſſeſs a great deal of wit, and others, on the contrary, are found to be very ſtupid, I am of opinion, that this phenomenon depends upon the different action of the rachitis on the head, and upon the conſequent form the bones of the ſkull aſſume. In reality, the ſhape of the ſkull is of the greateſt moment for the evolution of the faculties of the mind; ſo that, *ceteris paribus*, the ſenſibility or ſtupidity of the mind, for the moſt part, may be judged of by it. At leaſt the learned Dr. Veirac, who has had an opportunity of treating many rickety children, always obſerved, that children who acquired from the diſeaſe a large capacious forehead, with prominent eyebrows, and whoſe eyes therefore ſeemed to ſink in, were endowed with a fine genius: whereas other children, in whom the rickets occaſioned a flat and ſomewhat crooked forehead, eyes more or leſs protuberant, a riſing crown of the head, and the hinder part of the head prominent, became ſtupid *.

The rickets may be eaſily and ſpeedily cured in the commencement: but when inveterate, it is re-

* L. l. §. 18, p. 97 & ſeq. & §. 70, p. 112.

quiſite

quiſite in the prognoſis to attend to the ſtate of the lungs, and the abdomen; the febrile commotions; and the tumefaction of the body. For if a pulmonary conſumption have been produced in conſequence of a tranſlation of the diſeaſe to the lungs; if dropſy have been brought on by the continuance of the diſorder; or if the abdomen be very much ſwelled and hard; eſpecially if this tumour of the abdomen be attended with a hectic fever; the patients are always in the utmoſt danger, and the diſeaſe has uſually a fatal termination. Whereas, if theſe ſymptoms be wanting, though the malady be of long ſtanding, they are generally reſtored to perfect health.

After removing the remote cauſes, and cleanſing the *primæ viæ*, the cure of the rickets is to be obtained by anſwering the three following indications.

1, The rachitic character, and the too great irritability of the lymphatic veſſels, are to be removed; and ſuch a diſpoſition of the ſolids is to be induced, that the morbid matter may be expelled from the body through the different emunctories by the *natura medicatrix*. This indication is accompliſhed by ſoda, magneſia, and the other abſorbent earths, aſafœtida, woody-nightſhade, and tonics.

2, During the whole courſe of the diſeaſe, the *primæ viæ* ſhould be kept clean by the occaſional exhibition of emetics and purgatives.

3, The ſyſtem in general, and the chylopoietic organs in particular, are to be ſtrengthened by bark, bitters, the preparations of ſteel, the decoction of

madder, cold bathing, a nouriſhing diet, bodily exerciſe, and country air.

As the rickets in a great meaſure originate from the general laxity and debility of the ſyſtem, eſpecially from the relaxed tone of the digeſtive organs, on the weakneſs of which the morbid irritability of the lymphatics chiefly depends: it is evident, that, in the inveterate ſtate of the diſeaſe, emetics, purgatives, ſoda, and abſorbent earths, are of little uſe, without tonics; and at moſt do nothing but palliate the ſymptoms. Hence tonics ſhould always be given along with the ſoda and abſorbents, in order to enable the *natura medicatrix* to expel the morbid matter. Indeed in this diſeaſe, to ſtrengthen the habit, is generally all that is requiſite; and the ſolids being reſtored to their due tone, nature uſually gets rid of the morbid matter by their efforts.

If the inveterate rickets cannot be cured either by nature, or by art, the patients are deſtroyed either by an apoplectic fit amid convulſions; by the dropſy; by the pulmonary conſumption; or by the meſenteric tabes.

I have already treated above of the manner in which theſe diſeaſes deſtroy life.

GENUS

GENUS III.

Scurvy.

The ſcurvy is known by a change of colour in the face from the natural and uſual look to a pale and bloated countenance; a liſtleſſneſs to exerciſe; a ſtiffneſs and feebleneſs of the knees; a ſoftneſs and bleeding of the gums; a dry rough ſkin, marked with ſpots of different colours; œdematous legs, and a hardneſs of the muſcles, particularly a degree of rigidity of the hamſtrings. In the more advanced ſtages of the diſeaſe, the breath becomes fetid and offenſive; the urine is high coloured, fetid, and ſmall in quantity; ulcers break out, eſpecially in the gums and legs; theſe ulcers are covered with a ſoft ſpongy ſubſtance, which if removed is quickly produced anew; yellow, purple, and livid ſpots appear on the ſkin; tumours ariſe in various parts of the arms and legs; ſhifting pains occur all over the body, but eſpecially in the ſhin-bones; ſevere pains in the ſide enſue, with difficult and oppreſſive reſpiration, frequent faintings, and catching of the breath even on ſlight motion or expoſure to a colder air than is commonly breathed by the patient. Nay it is by no means uncommon for ſcorbutic ſailors to walk upon deck and to drop down dead; or to expire when moved from the ſhip in order to be put on ſhore. The patients are in general coſtive; though ſometimes they labour under a diarrhœa with griping and bloody ſtools: the teeth frequently drop out, and

ſometimes

ſometimes a ſalivation comes on; hemorrhages are frequent from different parts of the body, eſpecially from the noſe, and from ulcers: every ſlight diviſion of the ſkin degenerates into a foul ſore, and old cicatrices often break out afreſh: the epiphyſes, apophyſes, and even the cartilages ſeparate from the bones; and the bones themſelves ſometimes grow brittle and ſoftened, ſo that ſpontaneous fractures have occaſionally happened, a remarkable inſtance of which the learned Dr. Bonn deſcribes and delineates*. Dr. Lind mentions caſes, wherein even the callus, which had been completely formed a long time before, became again ſoft, and the fracture ſeemed as if it had never been conſolidated †. Theſe phenomena, in the ſame manner as in the rickets, ſeem to be explicable partly from the greater abſorption of the bony ſubſtance, and partly from the ſecretion of a peculiar matter not to be changed into firm bone.

The prediſpoſing cauſes of the ſcurvy are whatever debilitates the body in general, and the lymphatic ſyſtem in particular. The chief are preceding diſeaſes, fatigue, cold, moiſture, indolence, want of cleanlineſs and exerciſe, and the ſedative paſſions.

The occaſional or exciting cauſes of ſcurvy are a diet of ſalted or ſmoke dried proviſion, or the want of freſh victuals, eſpecially of the vegetable kind. But it is to be obſerved, that the living

* *Tab. Oſſ. morboſ.* tab. xx, fig. 2.

† Lind *on the Scurvy*, p. 253.

upon

upon ſalt proviſion does not generally produce the diſeaſe in perſons, in which the requiſite prediſpoſition is wanting. Dr. Lind aſſures us, that " he " had known meſſes as they are called of ſeamen, " who have lived during a voyage of three years " on the ſhip's proviſion for want of money to pur- " chaſe a better fare, eſpecially greens, and yet " have preſerved their health." The ſame author, who has been frequently in the way of ſeeing this diſeaſe in all it's different forms, perhaps more than any other phyſician living, obſerves, " that " this diſorder is for a long time confined to the " common ſeamen; and though the officers ſervants " are at ſuch times often afflicted with it, while " uſing the ſame diſhes with their maſters; yet it " is but rare to ſee the diſeaſe in even a petty " officer *;" " that the warrant officers, though " often obliged to live upon the ſhip's proviſions, " yet by lying in warm dry cabbins, and going " better clothed, are ſeldom attacked with the " ſcurvy, unleſs during it's moſt violent rage, and " when the common ſailors have been previouſly " almoſt deſtroyed by it †." Of the great influence the prediſpoſing cauſes have in producing the ſcurvy; the ſeamen under the command of Lord Anſon, in the year 1746, afforded a ſtriking inſtance. Lord Anſon cruiſed four months, waiting for the Acapulco ſhip in the Pacific Ocean, during which time the men continued in perfect health; but after leaving the coaſt of Mexico, the weather becoming cold and rainy, in leſs than ſeven weeks at ſea the ſcurvy became highly deſtructive, not-

* L. 1. p. 43. † L. 1. p. 69.

with-

withſtanding he had plenty of freſh proviſion and good water on board *.

Another not leſs remarkable inſtance of this we have lately ſeen in the dreadful ſcurvy, which broke out in the year 1786, among the Ruſſian ſailors, then living on ſhore at Cronſtadt. Theſe people were kept remarkably naſty, they were badly clothed, and their lodgings were very dirty, damp, and imperfectly aired. It is true indeed, that their diet was a very improper one, and extremely tending to produce the ſcurvy; but as the Ruſſian ſeamen are in general capable of living upon ſuch a diet, without being particularly afflicted with the ſcurvy, the raging of the diſeaſe is no doubt to be explained from the want of cleanlineſs, cold, improper air, and humidity of the atmoſphere in which they were obliged continually to live.

But though in general the prediſpoſing and exciting cauſes concur in the production of the ſcurvy, yet their concurrence is by no means neceſſary to produce the diſorder: for the prediſpoſing cauſes may operate as an exciting cauſe in perſons already weakened either by theſe very cauſes, or by others; and thus bring on the ſcurvy without the concurrence of the exciting cauſes: whereas the prediſpoſition, and afterwards the diſeaſe itſelf, may be communicated to healthy perſons by the exciting cauſes alone, when their action has been protracted for a conſiderable time. Hence it is eaſy to be explained, why the living upon ſalt proviſion is by no means requiſite to produce the ſcurvy; the ſcurvy being frequently met with on

* Lind, l. l. p. 52, 53, 55, 62, and 69.

ſhore,

ſhore, eſpecially in perſons expoſed to cold and moiſture: why ſometimes the ſcurvy rages, where freſh vegetables are not wanting*: why it may make it's appearance even among the inhabitants of a dry and pleaſant country†: and why, in fine, the ſtrongeſt and moſt hardy ſeamen very often labour under the ſcurvy in a high degree.

The manner in which improper food, or the want of freſh victuals, which is doubtleſs the moſt powerful exciting cauſe of the ſcurvy, brings on the diſeaſe in the prediſpoſed, ſeems to be this. Salted or ſmoke dried proviſion is a food difficult to be digeſted, when uſed for any conſiderable length of time, unleſs in perſons of a remarkably ſtrong conſtitution. The ſtomach and inteſtines do not ſuffer by ſuch diet; on the contrary it ſeems rather to improve the appetite; but the lymphatic ſyſtem, the function of which is to prepare the conſtituent parts of the blood, cannot but with difficulty convert ſuch food into pure lymph. Hence, when it is weakened by any cauſe, the lymphatic ſyſtem is no longer capable of counteracting effectually the ſtimulus occaſioned by ſuch a diet; but, being ſpecifically ſtimulated by this, the abſorbent veſſels, eſpecially the lymphatic glands, undergo a ſpecific alteration; the conſequence of which is the ſecretion of a matter of a peculiar kind, which contaminating the chyle, and being conveyed with it into the blood, infects the whole conſtitution, and produces the ſcorbutic diatheſis of the ſyſtem. It is not therefore the deficiency of nouriſhment, that cauſes the diſeaſe

* Lind, l. 1. p. 61. † Macbride, l. 1. vol. ii, p. 382.

in

in queſtion; for though it be allowed, that ſalt meat undergoes great alterations, and is by no means ſo nutritious as freſh beef, yet ſuch a diet is ſtill nouriſhing enough to allow all the functions of the body to go on: but the ſcurvy is produced by the morbid ſtimulus communicated to the lymphatic ſyſtem by the ſalt proviſion. Hence, the ſcurvy may be brought on, not only by ſuch a diet, but alſo by other cauſes ſtimulating the abſorbent ſyſtem in a ſpecific manner.

As thus all the prediſpoſing cauſes of the ſcurvy operate by weakening the body in general, and the lymphatic ſyſtem in particular; and it's exciting cauſes act by ſpecifically ſtimulating the lymphatic ſyſtem; the proximate cauſe of this diſeaſe ſeems to conſiſt in a debility of the abſorbent ſyſtem joined with it's preternaturally increaſed irritability. Hence may be explained why the ſcurvy, as to ſome ſymptoms, bears a degree of affinity to the ſcrofula and rickets; though the degree of the debility and irritability of the abſorbent ſyſtem is very different in the ſcurvy to that obſerved in both theſe diſorders, and therefore the remedies highly uſeful in thoſe are of no efficacy at all, or even prove hurtful, in this.

Now that the debility of the lymphatic ſyſtem, joined with it's preternaturally increaſed irritability, is the real ſource of the ſcurvy, the following arguments prove beyond all doubt.

1, The torpor of the vital principle, which always accompanies the ſcurvy, is by no means owing to a real debility of the whole body, but to it's languor alone, brought on by the morbid ſtate

of the lymphatic ſyſtem; as is demonſtrated by the cure of the diſeaſe: for in all ſtages of the ſcurvy, even in the higheſt degree of the diſorder, the uſe of freſh vegetables, eſpecially of acid fruits, performs the whole cure, and the ſcorbutic patients are ſoon reſtored from the extreme of ſickneſs to perfect health by the uſe of them, without the aid of any other medicine. Thus it is evident, that the ſcurvy does not depend on a debility of the whole body, but is produced by a morbid ſtate of the lymphatic ſyſtem.

2, That the debility obſerved in the ſcurvy originates from a morbid ſtate of the abſorbent ſyſtem, and by no means from the debility of the general habit, is likewiſe proved by the inefficacy of thoſe medicines, which invigorate the ſyſtem in caſes of real debility. Wine, a very powerful cordial, gives but a momentary ſtimulus, and checks not in the leaſt the progreſs of the diſeaſe. The Peruvian bark, ſnake-root, contrayerva, the different preparations of ſteel, and other tonics, though given in the largeſt doſes, are not productive of any benefit to the patients: whereas the debilitating citric acid in a ſhort time puts a ſtop to the diſeaſe, by producing a ſpecific change in the action of the abſorbent ſyſtem.

3, That the ſcurvy is a diſeaſe of the lymphatic ſyſtem is alſo clear from it's ſymptoms. For the diſeaſe is in general accompanied with œdematous legs, the anaſarca is likewiſe a frequent attendant upon it, and the termination of the ſcurvy in dropſy is very common.

Dr.

Dr. Lind, in conformity to the common opinion, attributes, it is true, these symptoms to profuse evacuations of dissolved blood: but this is an erroneous idea, wholly refuted even by his own observations; for he assures us, "that he had bled at "different times above a hundred patients in all "the different stages of the disease, having even "ventured in the last stage to take away an ounce "or two of blood in order to inspect the condition "of that fluid in dying persons." And upon the whole he has observed, that "the blood of those, who "were seized with the scurvy after a fit of sickness, "or a fever of long continuance, was generally of "a soft and loose texture. But the blood of most "other scorbutic patients was in a natural state; "there was generally, after it had stood some time, "a perfect separation of the water or serum from "the red concreted mass; the latter even in the "last stage of the disorder was firm, and com-"pact, and often covered with some white streaks, "or what is commonly called the gluten or size of "the blood *." The doctor's observations thus evidently show, that these symptoms are not owing to the dissolved state of the blood, but to the morbid condition of the lymphatic system.

4, That the irritability of the absorbent system is preternaturally increased in this disease, is evident from the extreme sensibility of the scorbutic patients to the qualities of the air: for they always feel themselves very uncomfortable, when exposed to a colder atmosphere; all the symptoms of the

* Lind, postscript, sect. 3, p. 512.

diſeaſe are increaſed by a cold, damp, and rainy air, and on the contrary are diminiſhed by a dry and hot one. This opinion is farther confirmed from the diſtemper's being remedied by the acid fruits, which ſeem to counteract the morbid irritability of the abſorbent ſyſtem by removing the morbid ſtimulus.

5, In fine, the diſſections of ſcorbutic bodies demonſtrate beyond diſpute, that the diſorder derives it's origin from a ſpecific alteration, which the abſorbents, particularly the lymphatic glands, have undergone. For in ſuch bodies the glands of the liver, ſpleen, and more eſpecially of the meſentery, are always found enlarged, ſpecifically altered, and often either wholly indurated, or ulcerated. Tubercles alſo are frequently met with, both in the lungs, and in the kidneys, from a tranſlation of the diſeaſe *. All which leave no room to doubt as to the primary ſeat of the ſcurvy.

The theories, which have hitherto prevailed with medical writers in order to account for the proximate cauſe of the ſcurvy, are chiefly the three following.

1, That the ſcurvy is owing to general debility, or diminution of the vital principle: an opinion, the contrary of which has already been clearly demonſtrated.

2, From the moſt ancient authors till within theſe few years the ſcurvy had been claſſed among

* Lind, l. l. p. 244 and 245.

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the putrid diſeaſes. Even the great Cullen, otherwiſe ſuch a ſtrong advocate for the doctrine of the ſolids, is of opinion, that the proximate cauſe of this diſorder is owing to an evolution of a large quantity of ſaline matter, and a ſtrong propenſity of the blood to putreſcence brought on by the uſe of animal food, eſpecially by the living upon ſalt proviſion.

That this opinion is void of all foundation, the conſideration of the following arguments will manifeſtly prove.

The ſcurvy in it's commencement ſhows no other ſymptoms but ſuch as are owing to the debility of the ſolids, and the torpor of the vital principle: and no change of the fluids appears, except in parts in which the diſeaſe has already made great progreſs, as for inſtance the gums; and, ſtrictly ſpeaking, the morbid ſtate of the gums belongs to the ſecond ſtage of the ſcurvy, in it's firſt ſtage the gums appearing ſound.

The blood of ſcorbutic patients, though it is manifeſtly of a darker colour, yet, even in the laſt ſtage of the diſeaſe, has no peculiar ſmell, is firm and compact in it's texture, coagulates in the uſual way, and does not ſooner grow putrid than other blood in the ſame degree of heat: all which phenomena are inconſiſtent with a putreſcence of the fluids.

A great difference exiſts between the ſymptoms of ſcurvy, and thoſe which accompany putrid diſ-

eaſes: for in putrid diſeaſes the appetite is gone, and ſordes of the *primæ viæ* are almoſt conſtantly found; on the contrary in the ſcurvy the *primæ viæ* are very often clean, and the appetite is generally vigorous till death. Febrile commotions always attend putrid diſeaſes; but they are wanting in the ſcurvy, when not complicated with ſome other diſeaſe. Dr. Lind obſerves, that the ſcurvy is altogether of a chronic nature, and that fevers may be juſtly reckoned among it's adventitious ſymptoms *.

In fine, the ſcurvy is ſoon cured by uſing freſh vegetables, and the patients are quickly reſtored to perfect health by a plentiful uſe of them. It makes little difference of what kind theſe plants are, if only freſh, and of a nature to admit of a copious uſe of them: acid and alkaline, mild and pungent, ſweet and bitter, equally cure the ſcurvy; though their ſenſible qualities are quite oppoſite, and the effects, which they otherwiſe produce on the conſtitution, different †. Biſſet, Lind, and Cullen, though they obſerve, that the acid fruits, oranges and lemons eſpecially, are far the moſt powerful in remedying the ſcurvy, yet affirm, that other plants, even thoſe of the alkaleſcent tribe, which, though they do not contain alkali in an uncombined ſtate, are greatly inclined to putrefaction, likewiſe prove particularly uſeful in the ſcurvy; and that their uſe ſuffices to accompliſh a perfect cure of the diſ-

* L. l. p. 106.

† Macbride, l. l. vol. ii, p. 389.

eaſe.

eaſe*. Now it is pretty evident, that ſuch plants cannot poſſibly correct a putrid diatheſis of the blood: a circumſtance, which ſeems to have been entirely overlooked by the advocates of the humoral pathology.

3, Dr. Trotter, phyſician to his majeſty's fleet under the command of lord Howe, has lately advanced a new theory on the proximate cauſe of the ſcurvy. This able phyſician obſerving the blood of ſcorbutic patients to be always of a darker colour, often bordering upon black, and the quick removal of the higheſt degree of ſcurvy by acid fruits, eſpecially by the juice of oranges and lemons, was led to the idea, that the proximate cauſe of ſcurvy is a want of the due proportion of oxygen in the blood; which is reſtored to the circulating fluid by uſing freſh vegetables, eſpecially acid fruits. Having thus aſcribed the ſcurvy to a want of oxygen, he is greatly embarraſſed to aſſign the reaſon, why every acid is not equally effectual in the cure of the diſeaſe, why acids, which poſſeſs much more oxygen than the lemons, are nevertheleſs of no efficacy at all in putting a check to the diſorder. To reconcile this fact with his theory, he ſuppoſes, that, by increaſing the proportion of oxygen, or by bringing the radical to a more perfect ſaturation, their reciprocal attraction is increaſed; ſo that the acids thus ſaturated with oxygen are incapable of being decompoſed in the body, but only act upon the fat, and diſpoſe it to run off by the excretions. The

* Cullen, l. l. § 1804 and 5: Biſſet, *on Scurvy*, p. 102: and Lind, l. l. p. 194.

doctor is not less at a loss, to explain how this want of oxygen takes place in people breathing an atmosphere containing a large proportion of vital air. To remove this difficulty, he has recourse to another hypothesis: namely, that it is requisite not only to take in oxygen by respiration, but by the stomach likewise; so that the breathing of a more pure air cannot compensate the not taking in of the due quantity by the stomach.

Though this theory at the first appearance seems to be specious, yet to apply this doctrine to account for the proximate cause of scurvy is attended with insuperable difficulties. The doctor's explanations, why a want of oxygen happens in persons breathing a very pure air, and why the acids, which contain a much larger quantity of oxygen than the citric, are of no power at all in checking the progress of the scurvy, are indeed altogether theoretical speculations, and refuted by daily experience. The mineral acids have great efficacy in the cure of putrid diseases; and they are not less efficacious in many other disorders; as for instance in different hemorrhages. Certainly no one will maintain, that in these cases they only act upon the fat, or pass through the body pure and unaltered, as when taken into the stomach. Does the nitrous acid, when exhibited in the lues venerea, pass unaltered through the body? Does not experience teach us, that the powers of digestion are very capable of decomposing vinegar? As thus upon many occasions the mineral acids and vinegar undergo a decomposition in the body, the natural inference must be, that the doctor's explanation of their inefficacy in scurvy from their being incapable of decomposition in the body, falls to the ground.

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The doctor's ſuppoſition, that, though breathing a pure air, it is ſtill neceſſary to take in a quantity of oxygen by the ſtomach, is likewiſe ill founded. For it is at preſent pretty generally allowed, that the florid colour of the blood depends upon an alteration it undergoes when paſſing through the lungs, by which oxygen is attracted, and the azote, together with the carbonic acid gas, is expelled. It is likewiſe proved, that the attraction of the oxygen is always in proportion to the more or leſs vivid action of the lung-veſſels, ſo that in the ſame ſpace of time different perſons take in a different quantity of oxygen, according to their different conſtitution. The want of oxygen in the ſyſtem, and the conſequent darker colour of the blood, are therefore owing to a ſpecific alteration the lung-veſſels have undergone in conſequence of the ſcorbutic diatheſis of the body, by which they leſs eagerly take in oxygen than in the healthy ſtate; and is by no means to be derived from the not taking in a due quantity of oxygen by the ſtomach.

The want of oxygen is therefore an effect, and by no means the cauſe of the ſcurvy. Indeed if to remedy the ſcurvy nothing were requiſite, but to throw a quantity of oxygen into the ſyſtem, the natural inference would be, that it was a matter of indifference, whether to cure the ſcurvy we made uſe of the citric acid, or of the concentrated acid of tartar, ſince both theſe acids ſtand nearly in the ſame ſcale with reſpect to the affinity of their radicals to oxygen. This however is found by experience not to be the caſe; and the learned author himſelf aſſures us, that, though the concentrated acid of

tartar

tartar approaches very near to the citric acid in all it's ſenſible qualities, it doubtleſs does not poſſeſs it's medical powers, for it had been given to ſix drachms a day without the leaſt benefit *. Sugar is well known to contain a large quantity of oxygen: there is no doubt, but that ſugar may be decompoſed by the organs of digeſtion: to remove the ſcurvy, if it conſiſted ſolely in the want of oxygen, it would therefore be ſufficient, to put the patients upon a ſugar diet. But upon trial it has been found, that ſugar, though given in the largeſt quantities, does not check the progreſs of the diſeaſe †. If for removing the ſcurvy it were only requiſite to impart oxygen to the ſyſtem, we might naturally be inclined to ſuppoſe, that mercury would be a very uſeful remedy in this diſorder; as it's different calces ſoon give out their oxygen. Mercurials, however, far from having any efficacy in the diſeaſe, prove hurtful to the ſcorbutic. It needs ſcarcely to be obſerved, that the ſcurvy may ariſe, where freſh proviſion is not wanting; and that ſalt proviſion contains a pretty large quantity of oxygen; as the above remarks are very ſufficient to ſhow, that this theory is altogether groundleſs.

It appears thus, that the ſcurvy is not produced either by a general debility of the ſyſtem, by a tendency of the blood to putrefaction, or by the want of oxygen; but that the diſorder is brought on, when the debilitated lymphatic ſyſtem is ſpecifically acted on by ſome morbid ſtimulus, ſo that, having undergone a ſpecific change, the conglobate glands

* Trotter, *Medical and Chemical Eſſays.* † Trotter, l. l.

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ſecern a ſpecific matter partaking of the ſcorbutic character.

The ſcorbutic diſpoſition of the lymphatic ſyſtem produces the following effects.

1, The ſpaſmodic contraction of the lymphatics, and their irregular motions, put a ſtop to the abſorption of the ſecreted humours. The abſorbents either ſlowly propel or effuſe in ſome place the contained fluid; whence œdematous legs in moſt caſes accompany the diſeaſe, and anaſarca, aſcites, and hydrothorax are frequently it's conſequences; for, according to the obſervations of Dr. Poupart, in moſt of thoſe, who had laboured under a difficulty of breathing, a certain quantity of water or ſerum, more or leſs according to the degree of oppreſſion, was found *.

2, As a fluid partaking of the ſcorbutic character is continually generating by the ſpecifically altered lymphatic glands, the chyle, during it's paſſage through the lymphatic ſyſtem, is contaminated with it; the infected chyle, entering the ſanguiferous ſyſtem, communicates the taint to the blood, which, being conveyed through the whole body, ſpecifically acts upon the ſolids; and the ſolids, reacting on the fluids, alter their whole craſis, and bring about the ſcorbutic diatheſis, the chief conſequences of which are the following.

1, The ſcurvy excites tranſient pains in the cavities of the thorax and abdomen, often ſhifting to oppoſite ſides. On account of the pre-

* Lind, l. l. pt. ii, chap. vii, N. 3 & 4.

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ternaturally increaſed irritability of the lymphatic ſyſtem, the ſcorbutic patients are very ſenſible to the different qualities of the atmoſphere, and extremely liable to other diſeaſes, which rage at the ſame time with the ſcurvy. From the ſame ſource it may be accounted for, why thoſe, who have laboured under a high degree of the ſcurvy, are afterwards ſubject in different periods of their lives to habitual rheumatiſm, pain and ſtiffneſs in their joints, and ſometimes to cutaneous eruptions; and are afterwards much ſooner attacked by the ſcurvy than others. It has been generally ſuppoſed, that in the ſcurvy the blood was changed into a thin diſſolved red humour; that it's ſerum became greeniſh, and acrid to the taſte: but at preſent it is clearly proved, that the blood is as firm and compact as uſual, though it is of a darker colour, and that it's ſerum is inſipid *. The circulating maſs being infected, the ſecretory organs muſt of courſe likewiſe partake of it's alteration from the healthy ſtate: accordingly, the breath becomes offenſive, the ſweat, when any appears, is viſcid and fetid, the ſtools are extremely ſtinking, and the urine becomes fetid and high coloured; in a word, all the ſecretions partake in a greater or leſs degree of the depraved craſis of the blood. The vital powers, attempting to expel from the body the morbid matter, depoſite it partly at the ſurface, where, according to the different reaction of the ſecerning organs, it aſſumes a different form; hence the ſcorbutic exanthema may be light blue, purple, petechial, miliary, or eryſipelatous. The livid ſpots, however,

* Lind, l. l. p. 512.

which

which appear between the muſcles in the extremities, are generally nothing but effuſed blood, poured out by the veſſels giving way even to the uſual exertions of the muſcles. From the attempt nature makes to get rid of the morbid matter is alſo to be explained, why ſometimes in the convaleſcent there is obſerved an eruption of numerous ſmall pimples, containing either a purulent or wateriſh fluid, while in many other caſes a dry ſcurf appears on the head and face *.

2, The ſcorbutic matter, acting on the lymphatic glands, excites in them a chronic inflammation, often terminating either in a ſuppuration, or in a total deſtruction of their organic compoſition. What effects it has on the lymph, for want of obſervations, I am incapable of determining.

3, A tranſlation of the diſeaſe takes place to different organs, eſpecially the lungs and kidneys; which alſo contributes to the difficult reſpiration, and the violent painful conſtriction of the thorax, and cauſes the ſevere ſtrangury ſo often obſerved in this diſeaſe, which ſometimes proves fatal.

The prognoſis of the ſcurvy differs according to the different ſtage of the diſeaſe, it's different complication with other diſorders, and the different conſtitutions of the patients. In general the diſeaſe is ſoon removed by the uſe of freſh vegetables in the firſt ſtages: in the laſt ſtage, however, a ſevere oppreſſion of the breaſt, and great difficulty of reſpira-

* Lind, l. l. p. 117 & 136.

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tion, often indicate an approaching phthiſis or dropſy. All complications with other diſeaſes no doubt make the ſcurvy worſe, yet it's conjunction with the putrid fever is the moſt to be feared of them all *. Laſtly, great attention is to be paid to the conſtitution of the patient, becauſe, *ceteris paribus*, perſons, in whom the tone of the ſolids has been impaired by previous diſeaſes, are much leſs capable of bearing up under the ſcurvy, than ſound and robuſt men. But the ſcurvy, when curable, is much ſooner remedied than any other diſeaſe; and the patients, even in the laſt ſtage of the diſeaſe, are reſtored to perfect health within a few days.

The indications of cure in the ſcurvy are the two following.

1, The ſcorbutic diſpoſition is to be removed, and ſuch a ſtate of the ſolids is to be induced, that the morbid matter may be ſeparated from the maſs of fluids.

2, The morbid matter is to be expelled from the body by diaphoretics, diuretics, and gentle purgatives.

Theſe indications are anſwered by uſing freſh vegetables, eſpecially acid fruits, in the firſt ſtages of the ſcurvy: for as ſoon as the ſcorbutic diſpoſition is removed by their uſe, the apparent debility of the ſolids ſoon diſappears, nature ſpontaneouſly expels the morbid matter, and thus a ſtop is put to

* Stoll, l. l. p. 5.

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the diſeaſe. But in the laſt ſtage phyſic ſhould ſuccour nature by the uſe of gentle purgatives, diuretics, and diaphoretics, in order to accelerate the cure: though the ſcurvy, even in it's laſt ſtage, may be removed by the uſe of freſh herbs, or acid fruits alone, without any other remedy. Bleeding, emetics, and ſtrong purgatives, are always injurious in this diſeaſe, which does not bear ſtrong evacuations.

When I ſay, that a plentiful uſe of acid fruits ſuffices to accompliſh the radical cure even in the higheſt degree of the ſcurvy, I wiſh to be well underſtood: for, as it is a fact, that perſons, who were healthy and ſtrong before the ſcurvy made it's attack upon them, are perfectly reſtored by the uſe of acid fruits, and need no tonics; yet, on the other hand, perſons, who have been weakened by other diſeaſes before they are afflicted with the ſcurvy, though the ſcurvy is removed by the uſe of the antiſcorbutics, remain as weak as they were previous to it's appearance, ſuch perſons, therefore, ſtand in need of the bark, aromatics, tonics, bitters, and chalybeates, to prevent their being afterwards ſo eaſily affected by the morbid ſtimuli. Nay, ſometimes, eſpecially in the ſcurvy which appears on ſhore during the winter, the prediſpoſing cauſes, which all operate by debilitating the ſyſtem, have ſuch a conſiderable ſhare in producing the diſeaſe, that it becomes neceſſary to give aromatics and tonic bitters along with the antiſcorbutics from the commencement of the diſeaſe. Indeed I have frequently ſeen the ſcurvy attack poor people living principally on potatoes, with occaſionally a little pork, in whom the diſeaſe chiefly originated from debility brought

on by fatigue, cold, moiſture, and want of cleanlineſs. In theſe caſes, if the uſe of tonics be neglected, the patients are but ſlowly cured; and though the ſcurvy is removed, yet the convaleſcent retain the prediſpoſition to the diſeaſe, and, as ſoon as an exciting cauſe acts upon their weak bodies, the ſcurvy returns afreſh. It is therefore often adviſable in theſe caſes, from the very commencement of the diſeaſe, to combine the antiſcorbutics with tonics.

Freſh vegetables and acid fruits are thus found to be the beſt means both of preventing and curing the ſcurvy: but it is greatly to be regretted, that this diſeaſe chiefly rages at ſea, during long voyages, and where often neither freſh vegetables nor acid fruits can poſſibly be procured. The queſtion therefore is, whether it be poſſible to prevent ſeamen from being attacked with the ſcurvy during long voyages, and what are the proper means: a matter in reality of the firſt importance to a very valuable part of mankind, the ſeamen of all nations. It is to be recorded, to the immortal honour of the preſent board of admiralty in Britain, that it has paid the ſtricteſt attention to the medical department of the navy; and that, in order to preſerve the men from the ſcurvy, freſh vegetables and live cattle have been frequently diſpatched in frigates to the different fleets cruiſing on foreign coaſts; in conſequence of which the ſcurvy has ſcarcely appeared for ſome months. This muſt of courſe be acknowledged as the moſt effectual method of preventing this fatal diſorder; but as theſe precautions cannot always be put in practice, becauſe many ſhips, and even whole fleets, are frequently at ſuch a diſtance from home, as not to admit of being thus

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ſupplied; the queſtion ſtill remains, what is to be done in caſes, in which freſh vegetables and acid fruits cannot be had, to prevent and cure the ſcurvy?

In reply to this I anſwer, that I have no doubt, but, by adopting proper regulations, the ſcurvy may be always prevented from raging among ſeamen; and, when attacking ſome individuals, may likewiſe be readily ſtopped by proper treatment. The means, by which this deſirable end may be obtained, follow as it were naturally from what I have proved of the nature and cauſe of the diſeaſe; for the prevention of the ſcurvy, like that of all other complaints, depends upon an accurate knowledge of the noxious powers which produce it, and of the proximate cauſe of the diſorder. The remote cauſes are either prediſpoſing, or exciting.

The chief prediſpoſing cauſes are fatigue, preceding diſeaſe, want of cleanlineſs, cold, and moiſture: of which the laſt two are the moſt powerful prediſpoſing cauſes of the ſcurvy, and have commonly a conſiderable ſhare in producing the diſeaſe. Indeed it is well known, that the ſcurvy in general makes it's appearance after ſtorms, or cold rainy weather. Dr. Trotter is ſo well aware of this fact, that he ſays "every officer, who knows his duty, "will be as cautious as ſervice will admit of in "expoſing his ſhip's company to either cold or "rain." The expedition under the command of lord Anſon affords a ſtriking inſtance, that cold and moiſture is capable of producing the ſcurvy, though freſh vegetables are not wanting. Dr. Lind obſerves, "that warrant officers, though obliged

" to live upon the ſame proviſions as common " ſailors, yet by lying in dry cabins, and going " better clothed, moſtly eſcape the ſcurvy on ac- " count of the perſpiration being kept uninter- " rupted." This ſhows us, what influence the prediſpoſing cauſes generally have in producing the ſcurvy, and gives us a hint how to counteract them. Namely, the ſtricteſt attention muſt be paid to keep both the ſhip and the ſhip's company as clean and dry as poſſible; and all the ſailors muſt be provided with flannel ſhirts worn next the ſkin, thick woollen trowſers, and worſted ſocks in order to prevent the cutaneous veſſels from being ſo violently acted upon by the noxious ſtimuli. Every ſailor ought to have at leaſt two pair of woollen trowſers, two flannel under waiſtcoats, and ſeveral pair of worſted ſocks, in order to change his wet clothes for dry, after having been expoſed to cold rainy weather. Seamen obſerving theſe precautions will not only in general eſcape the ſcurvy, but be likewiſe much leſs ſuſceptible of being attacked with the dyſentery and remittent fevers. This I have not only obſerved myſelf, but it is alſo remarked by the ſagacious phyſician, whoſe opinion I have attempted to refute*.

The moſt powerful exciting cauſe of the ſcurvy is the living upon ſalt proviſion. This is to be counteracted both by medicines, by increaſing the vegetable part of the diet, and by bringing the vegetables as nearly as poſſible to their recent ſtate. To expreſs myſelf more clearly, it ought to be obſerved, that the exciting cauſes of the ſcurvy operate by ſpecifically ſtimulating the lymphatic ſyſtem,

* Trotter, l. l. p. 180.

the

the conſequence of which is, that the lymphatic glands undergo a ſpecific change, and ſecern a ſpecific fluid, partaking of the ſcorbutic diatheſis. We have ſeen, that cold and rain have a conſiderable influence in producing this diſeaſe. Dr. Lind found perſpiration to be a very ſalutary evacuation in the ſcurvy. Gentle laxatives are alſo, as is well known, of a conſiderable benefit in this diſeaſe. In fine, it has been proved, that, in the ſcurvy, the morbid matter is often diſcharged in part from the maſs of the fluids by the *natura medicatrix*, and carried to the ſurface; and hence, in the convaleſcent, not unfrequently pimples or dry ſcurf appear on the head, face, and other parts of the body. The natural inference therefore muſt be, that a remedy, poſſeſſing not only a laxative and diaphoretic quality, but which likewiſe has an alterative virtue, and clears both the lymphatic and ſanguiferous ſyſtems, by keeping up a determination to the ſurface, cannot but be productive of the moſt ſalutary effects. Such a remedy may be found in ſulphur, the laxative and diaphoretic powers of which no perſon will queſtion, for the fæces, the ſweat, and even the inſenſible perſpiration, acquire a ſingular ſmell by it's uſe. This is farther proved beyond all doubt by it's efficacy in diſeaſes frequently excited by external cauſes, ſuch as cold and moiſture; for inſtance in catarrh, rheumatiſm, and gout. That it likewiſe operates both on the lymphatic and ſanguiferous ſyſtems, is evident from it's efficacy in cutaneous diſeaſes; from it's virtue in caſes of repelled eruptions, in which it often brings them back again to the ſkin; and from it's ſtimulant power, by which it is found ſo ſalutary in many complaints of the lungs to promote expectoration.

If we farther compare the medical qualities of the ſulphur with the ſymptoms accompanying the ſcurvy in it's commencement, ſuch as liſtleſſneſs to all exerciſe, dry rough ſkin, ſtiffneſs and feebleneſs of the muſcles, eſpecially of the knees, *a priori*, no doubt will remain, but that the ſulphur muſt be efficacious both to prevent the diſeaſe, and to put a ſtop to it's progreſs in the firſt ſtages. Upon theſe principles I exhibited the ſulphur to ſeveral ſcorbutic patients, without having recourſe to the concentrated acid of lemons, or to other antiſcorbutics, and it invariably ſucceeded in removing the diſeaſe in it's firſt ſtages. In a few caſes I gave the cryſtals of tartar along with it; and this conjunction ſeemed to accelerate the cure. It is true, that theſe trials have been made on ſhore, on the ſcurvy occurring during the winter; but as the ſea and land ſcurvy are exactly the ſame diſeaſe, and differ only in the degree of violence; and as the medical powers of ſulphur are ſuited to the cauſes and nature of the diſeaſe; this drug will doubtleſs be found as efficacious in preventing the ſcurvy at ſea, as I have found it to be on ſhore. I would therefore adviſe, in order to prevent the ſcurvy, to give every man on board a ſhip half a drachm of ſulphur twice a day. This is an article, which may be procured almoſt every where; and a whole navy can be provided with a ſufficient quantity at a very ſmall expenſe.

But though the ſulphur no doubt will prove uſeful in preventing the diſeaſe, and putting a ſtop to it's progreſs in the firſt ſtages, yet as a preventive of the ſcurvy at ſea, where frequently many powerful

erful cauſes cooperate in producing the diſeaſe, it would not be ſafe to truſt to this medicine alone, without paying at the ſame time the utmoſt attention to the vegetable part of the ſeamen's diet. For though this medicine would generally prove ſufficient to prevent the diſeaſe in ſtrong healthy conſtitutions, which had never before been attacked with it, it would no doubt be inſufficient to keep off the ſcurvy from debilitated perſons, or thoſe who in former voyages had laboured under it in a high degree, all of whom are very liable to this diſeaſe.

Accordingly the ſtimulus given to the lymphatic ſyſtem by ſalt proviſion is to be counteracted by the uſe of ſour krout, an excellent antiſcorbutic, which is frequently uſed on board the dutch ſhips: and it is remarkable, that the ſeamen of the United Provinces, even at a time when their navy was in a very flouriſhing ſtate, and they had many ſhips at ſea in every part of the world, were comparatively much leſs ſubject to the ſcurvy, than thoſe of any other nation. Dr. Lind, who introduced it into the britiſh navy, ſaw ſuch ſtriking effects from it, that he goes ſo far as to ſay, "after the "cabbages are waſhed, their virtue is the ſame as "if taken freſh out of the garden." Though this expreſſion is no doubt too ſtrong, and the efficacy of ſour krout is not ſo great as that of freſh vegetables, yet I have myſelf frequently obſerved good effects from this preparation, when given on ſhore in the winter. If therefore it's antiſcorbutic powers in ſome caſes have been but very trifling, this was doubtleſs owing to it's having been either not well prepared, or not well dreſſed.

Other correctors of ſalt proviſion are onions, recommended by Dr. Milman, pickles of red cabbages, cucumbers, and french beans, the antiſcorbutic qualities of which are ſo elegantly detailed by Dr. Trotter. Theſe, being prepared in the uſual way, are to be ſerved on the days that ſalt beef and pork are iſſued to the ſhip's company. Gooſeberries, taken from the buſhes in a ſomewhat unripe ſtate, and carried to ſea, have been known effectually to put a ſtop to the ſcurvy. The expreſſed juice of red currants properly bottled may alſo be taken in a certain quantity on board of a ſhip, and would probably prove a powerful antiſcorbutic. It is true, that, on account of the coſt, a general ſupply of the laſt two articles to a navy is ſcarcely practicable; yet a fleet may be provided with a certain ſtock of them without any conſiderable expenſe, and they may be occaſionally diſtributed either to thoſe who are prediſpoſed to the ſcurvy, or when, on account of many powerful cauſes cooperating together, it is to be feared, that the diſeaſe will make it's appearance.

Pure water may juſtly be ranked among the chief preventives of the ſcurvy. Of the beſt means to preſerve it in that ſtate, to correct it when corrupted, and to freſhen ſalt water, Dr. Trotter has lately treated ſo fully, that I ſhall paſs by this ſubject in ſilence. The ſupplying of the navy with common table beer, made ſomewhat ſtronger than uſual, would likewiſe be found of the greateſt ſervice*: but it is to be lamented, that a man of war can ſcarcely be ſupplied with it for more than ſix weeks at moſt. It has been propoſed to ſerve out

* See the obſervations of Dr. Blane, *on the Health of Seamen.*

chocolate

chocolate to the ſailors for their breakfaſt, and the advantages, which would reſult from this, have been elegantly detailed by Dr. Trotter. But I am afraid, that, on account of the conſiderable expenſe, it's general introduction into the victualling of the navy is not to be expected. What I apprehend might be ſubſtituted in it's place is ſtrong coffee. It is doubtleſs evident, that the coffee does not poſſeſs the virtues of the cocoa; but ſtill it would be very comfortable for a ſailor, on coming from a wet deck in a rainy morning watch, to have a cup of ſtrong coffee along with his breakfaſt.

If theſe regulations were carried into execution; and if thoſe correctors of ſalt proviſion, which I have taken the liberty to recommend, were given along with biſcuit, flour, raiſins, oatmeal, and peaſe, the common vegetable part of ſea-diet; though I do not venture to ſay, that the ſcurvy would be cured or prevented on all occaſions; yet I have not the leaſt doubt, but that, by obſerving the rules I have attempted to lay down, the ſcurvy would always be prevented from raging among ſeamen, and that in general the attending to them would be ſufficient to cure the diſeaſe in it's firſt ſtages. But as for the cure of the ſcurvy no remedy is ſo powerful as lemons and oranges, and as the virtues of the citric acid concentrated either by evaporation, or what is much better by congelation, may be preſerved for the longeſt cruiſe, in all long voyages every ſhip's company ought to be provided with a certain quantity of it, and as ſoon as the other remedies are found to fail, recourſe ſhould be had to this ſalutary preparation, which with the greateſt

propriety may be called the ſpecific for the ſcurvy.

In ſpeaking of the correctors of ſalt proviſion I have not taken any notice either of the elixir of vitriol, or of malt; though the whole of the britiſh navy is ſtill ſupplied with both theſe articles. The firſt was introduced into the britiſh navy on the ſuggeſtion of the late Dr. Huxham. But, as this remedy was adviſed on the erroneous idea, that the ſcurvy conſiſted in a tendency of the blood to putrefaction, ſo all practitioners at preſent agree, that in the ſcurvy it is of no uſe at all. The malt was ſupplied to the ſhips upon the recommendation of Dr. Macbride: and though, on the firſt trials, we were told it was attended with much ſucceſs, yet Dr. Lind found it not to cure one out of one hundred and thirty ſailors to whom it was given *. Dr. Trotter never ſaw it's uſe attended with any good effects †. I have ſeen it tried myſelf in ſeveral caſes, but I never obſerved the leaſt benefit from it. Therefore, without queſtioning the veracity of thoſe gentlemen, who eſtabliſhed the credit of the malt, I cannot help thinking, that it might be advantageouſly laid aſide for the preparations I have attempted to recommend.

In fine, while laying down rules to prevent the ſcurvy, I have not taken notice of indolence and lowneſs of ſpirits, though theſe often powerfully co-operate in the production of the ſcurvy. The reaſon is, that the cure of theſe belongs rather to the department of the officer, than of the medical man; for, as Dr. Trotter very juſtly remarks, it is in vain

* L. l. p. 539. † L. l. p. 190.

for

for phyſicians to preſcribe rules of health, if the commanders of the ſhips do not pay regard to preſerving the health of the ſhip's company by proper regulations, and, by ſtudying the character and diſpoſitions of the human mind, comfort the ſailors, and become the friends and the fathers of the ſeamen under their command.

With reſpect to the manners of dying in the ſcurvy, they are numerous. The diſeaſe frequently terminates in dropſy, or phthiſis. Some are carried off either by a colliquative diarrhœa, or a mortification ſucceeding to inflammation of the bowels. Others die of hemorrhages, in which caſes the blood runs as it were out of a ſpunge through the whole ſurface of ſome organ, although, when the parts are cleaned, ſcarcely the leaſt trace appears, whence the blood flows. It is by no means wonderful, that ſuch patients, having already ſuffered under ſo many ſymptoms, are incapable of bearing the loſs even of a moderate quantity of blood, and often expire in the midſt of it's effuſion. Many are deſtroyed by ſuffocation, which happens in two ways; either when the lungs, already greatly weakened by the ſcorbutic diatheſis, become inflamed, and this ſpurious excitement of the vital principle, diſtending the lungs, brings on ſudden death by impeding reſpiration; or when this inflammation of the lungs terminates in an effuſion of ſerum into the cavity of the thorax, by which reſpiration may likewiſe be ſtopped. Laſtly, others die of ſyncope, brought on either by uſing exerciſe, or by a change of air. In both theſe caſes the velocity of the blood is accelerated, and a much greater quantity

returns

returns at once into the right cavities of the heart, and thence into the lungs, but the weakened veſſels of the lungs being incapable ſo quickly to tranſmit ſuch a conſiderable quantity, the blood becomes accumulated in the ſinus venoſus, and right auricle and ventricle of the heart, which cauſes a laborious reſpiration and panting; an effort being made by all the powers ſubſervient to reſpiration, to dilate the breaſt more fully and frequently, for the paſſage of this increaſed quantity of blood; which effort, when unſucceſsful, terminates in a fatal ſyncope: and hence may be explained, why in theſe caſes the right auricle and ventricle are always found filled up with coagulated blood.

GENUS IV.

Aneuriſm.

Every ſoft tumour ariſing in an artery is in an extenſive ſenſe named aneuriſm.

The cauſes of this complaint are either external or internal. Wounds, luxations, fractures, blows, falls, ſtraining to lift a heavy weight, in ſhort, whatever impairs the tone of the veſſels, or produces their rupture, by external violence, belong to the former; and all theſe may occaſion an aneuriſm even in a ſtrong healthy perſon. The internal cauſes are whatever diminiſh the tone of the veſſels,

or,

or, by disturbing the circulation, drives the blood forcibly to some part. Hence the plethoric, the hypochondriacal, and the hysterical, are more disposed than others to this disease. As, however, these morbid states frequently exist without occasioning an aneurism, a certain predisposition to this disease seems to be requisite, without which these noxious powers are incapable of producing an aneurism. Such a predisposition probably consists in a certain degree of debility of the sanguiferous system. This may depend upon a determinate structure of the primary constitutive parts of the body; in which case it sometimes seems to be hereditary: at least Lancisi records, that he has observed such an hereditary disposition in a noble family, in which four succeeding generations, namely, the great grandfather, the grandfather, the father, and the son, were afflicted with an aneurism*. Or the weakness of the sanguiferous system may be owing to previous diseases, by which the tone of the vessels is impaired: for instance, the scurvy, lues venerea, &c. This complaint either takes place in several parts of the body, or it is confined to one part, according to the different state of the sanguiferous system.

The diagnosis of this disease is often difficult, when the aneurism takes place in the principal vessels in the vicinity of the heart: yet a pulsation of the tumour synchronical with the other arteries, a heavy pain in the breast not unfrequently extending itself between the shoulders towards the ver-

* Lancisi, de *Mot. Cord. & Arteriar.* prop. 45.

tebræ, palpitation of the heart, a ſmall weak pulſe, tenſion of the abdomen, and ſometimes relief of the ſymptoms, by bending the body forward, are often to be obſerved.

The effects of this diſorder are giddineſs, apoplexy, a ſevere cough, hemoptyſis, ſyncope, difficulty of breathing, anxiety, ſuffocation itſelf, tabes, phthiſis, and hydrothorax; beſides, in general, in this diſeaſe when inveterate, the cartilages, and the bones themſelves, from the preſſure of the dilated artery, are affected by caries, and often in great part conſumed by abſorption.

In the prognoſis of the aneuriſm the following circumſtances ſhould be taken into the account.

1, The ſpecies of aneuriſm: for, *ceteris paribus*, the true is the moſt dangerous; the ſpurious afford greater hope of cure; and the varicous in general is not attended with any danger.

2, The different cauſes that have brought on the aneuriſm: ſince, if this malady appear without any external injury, or too violent exertion, it is to be feared, that it's origin is owing to a fault in the organic ſtructure of the ſolids; in which caſe the removing of the aneuriſm, either by compreſſion or ligature, is generally uſeleſs; becauſe a new aneuriſmatic tumour is in a ſhort time generated in another place, in conſequence of the ill formation of the ſolids. Thus in ſuch caſes the palliative cure alone is to be adopted.

3, The

3, The ſeat of the aneuriſm. If it take place in a part where neither ligature nor compreſſion can have the leaſt effect; if the artery be ſo large, that it might be apprehended the patient would die before the hemorrhage could be ſtopped; for inſtance, if the aneuriſm exiſt in the arteries either of the thorax or abdomen, the diſeaſe is deſperate: ſince, though the coats of the aneuriſmal ſac become greatly thickened, and are rendered ſtronger, cartilaginous and oſſeous films are appoſed to them, nay the ruſhing out of the blood is prevented by it's coagulation itſelf, and thus life is ſupported for ſome time: the diſeaſe has nevertheleſs always a fatal termination.

4, The age and conſtitution of the patients. In youth, when the ſolids are ſtill ſoft and flexible, the ſyſtem eaſily accommodates itſelf to various changes; it may be expected, therefore, that, the courſe of the blood being impeded through the aneuriſmal trunk, the collateral branches will be dilated by the blood, and from this dilatation the organ, the artery of which is tied, would be nouriſhed as well as before. But in a more advanced age, the ſolids, having already attained to great rigidity, ſuffer no more extenſion; for which reaſon the event of the cure then proves for the moſt part unfortunate. Beſides, it is requiſite, at leaſt when the operation of the aneuriſm is to be performed, that the patient poſſeſſes ſufficient ſtrength, becauſe otherwiſe he will not be able to ſupport the effects of the operation, but will die in the courſe of ſome days, from a mortification of the

the affected part taking place, or in conſequence of the general irritation produced by it.

On the treatment of this diſeaſe there is only to be ſaid, that the aneuriſm of the veſſels of the breaſt and abdomen admits of no cure, farther than a palliative one; which is accompliſhed by bleeding, gentle purgatives, anodynes, antiſpaſmodics, a very ſpare diet, and the greateſt tranquillity both of body and mind. The cure of the aneuriſmal tumour of the other parts is to be attempted either by tying the artery ſending blood to the aneuriſmal ſac, or by compreſſing the ſac itſelf, by which latter method Guattani has cured many aneuriſms even in an inveterate ſtate: of courſe the practitioner ſhould always try the effects of compreſſion, before he has recourſe to the operation, unleſs the indication of performing it be urgent.

If the aneuriſm be incurable, the preſſing column of the blood ſooner or later overcomes the reſiſtance of the coats, by which the aneuriſmal tumour is ſuſtained, and a rupture of the aneuriſm takes place. When this occurs, the patient ſometimes dies in a moment, a torrent of blood ruſhing out: at other times, indeed, life may be protracted for ſome time, even for a few months, by powerful applications; however, as a freſh quantity of blood flows at intervals out of the ruptured artery, at length, the veſſels being left almoſt deſtitute of blood, death enſues *.

* Morgagni, l. l. T. iii, lib. iv, epiſt. 50, n. 11 & 12.

GENUS V.

Mortification.

MORTIFICATION is a high degree of atony, ſucceeding to the inflamed ſtate of ſome part. It may be either incomplete or complete. In the firſt caſe, though the affected organ is of a livid blackiſh colour, and generally ſoft and flaccid to the touch, yet the part ſtill enjoys a ſlight degree of life: in the latter all ſenſation and life of the affected part are entirely loſt, it turns totally black, and emits a conſiderable fœtor. The incomplete mortification is called gangrene; the complete, ſphacelus.

Gangrene differs from ſphacelus only in degree; as a ſpark of life ſtill remains in the former, whereas in the latter life is totally deſtroyed. Gangrene does not always change into ſphacelus, and may be cured without any loſs of the parts, the affected organ being reſtored to it's due tone by proper means: whereas the ſphacelus is only to be remedied by the ſeparation of the dead part from the living.

The cauſes of mortification may with propriety be reduced to the four following claſſes.

1, Inflammations, either phlegmonous or erythematic. The phlegmonous inflammations, indeed, ſeldom change into gangrene, when properly treated in their commencement: but either by neglect

neglect or injudicious management they often terminate in mortification. On the contrary the erythematic have usually a strong tendency to gangrene, and often run directly into mortification; for which reason the erythematic inflammations are in general more to be dreaded than the true phlegmonic.

2, Stoppage of the circulation of the blood, and of the action of the nerves. This commonly happens from compression of some kind or other, as from tumours, convulsions, ligatures, in a word any cause capable of obstructing the chief arteries, that are destined to supply any part. It is however by no means requisite to mortification, that the stoppage of the circulation be complete; for it is often sufficient, that it only becomes in a great degree diminished. This is proved from the mortification occasioned by debility of the general system, and by the contraction and ossification of the sanguiferous vessels, which, though not wholly stopping the circulation, nevertheless frequently bring on gangrene. The gangrene to which old people are liable is a similar case.

3, External injuries either destroying the whole structure of the part, or producing atony of it. Wounds, intense cold, burning, too long confinement in a recumbent posture, &c. are of this kind.

4, The translation of any disease to some part of the body forms the fourth class. This is always owing to an imperfect crisis, the consequence of nature's being disturbed in the attempt to expel

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the morbid matter from the body: for the *natura medicatrix* being hindered in it's action, the morbid matter, inſtead of being diſcharged from the body by the emunctories, is depoſited on ſome organ, exciting thereby it's ſtimulus inflammation and gangrene. The gangrene of Pott ſeems to belong to this order, as being a catarrhal affection depoſited by tranſlation on the feet. At leaſt this opinion is ſtrengthened both by the teſtimony of Pott, that thoſe, who before had ſuffered vague rheumatic pains, were more affected with this complaint than other perſons *; and by that of Mr. Mulder, who obſerved a ſimilar gangrene in ſeveral dutch ſailors, after a catarrhal fever †.

Though for the ſake of order I have ranked the cauſes of mortification under four general heads, yet I am very much diſpoſed to doubt, whether mortification ever can take place without any preceding inflammation; though the degree of inflammation is often ſo ſlight, and paſſes ſo quickly away, as not to be obſerved.

The prognoſis in mortification is doubtful, and the patients are always in danger till the dead parts are ſeparated from the reſt of the body. The danger nevertheleſs differs,

1, According to it's different cauſe. For, ſince the mortification itſelf cannot be ſtopped, before it's cauſe is removed, it naturally follows, that the patients are in a greater or leſs danger in propor-

* L. l. pt. i, p. 65. † L. l. pt. ii, p. 84.

tion to the difficulty of removing it's cauſe. Hence, *ceteris paribus*, the mortification ariſing from an external cauſe is attended with leſs danger, than that originating from an internal: the ſphacelus, which ariſes from metaſtaſis of ſome morbid matter, is, in general, not ſo ominous, as that brought on by an incarcerated hernia; unleſs the tranſlation of the diſeaſe take place on ſome viſcus.

2, According to the different part. Since, if the mortification take place in any organ, the function of which is neceſſary to life, it quickly deſtroys the patient; as is proved by the gangrene of the viſcera: though, when the mortified ſpot is but ſmall, life may ſtill be protracted for ſeveral days, and ſometimes the patient may even recover.

3, In proportion to the extent, and depth of the affected part. For it is evident, that, where the gangrene is neither profound nor extenſive, the prognoſis is much more favourable, than when the mortification runs deep, and ſpreads greatly.

4, According to the ſtrength, conſtitution, and age of the patients. Thus the gangrene of the ſcorbutic, and cachectical, though brought on by an external cauſe, often kills; and that either depending upon a general debility, or old age, has uſually a fatal termination.

The indications of cure in mortification are the three following.

1, The progreſs of the diſeaſe is to be ſtopped.

2, The

2, The ſeparation of the dead part from the reſt of the body is to be promoted.

3, The ulcer remaining is to be conſolidated.

In the firſt place the cauſe of the mortification ſhould be accurately inquired into: for, if the diſeaſe be produced by a ſcorbutic, or ſcrofulous, diatheſis, or by any other internal cauſe, the mortification is kept up as long as it's cauſe remains. The remedies employed to remove the morbid ſtate are to be ſuited to the different cauſes of the mortification. Hence antiſcorbutics prove beneficial to the ſcorbutic; the medicines recommended in the ſcrofula are to be preſcribed in the mortification originating from this ſource; if repelled cutaneous eruptions have occaſioned the diſeaſe, they are to be brought back again to the ſurface; ſuppreſſed evacuations, when cauſing this diſorder, muſt be reſtored; in a word, various medicines are to be employed according to the different circumſtances. But if the cauſe of the mortification do not appear, or have been removed, the treatment is to be guided by the nature of the ſymptoms, and the conſtitution of the patient. Thus if a quick, full, hard pulſe, and the other ſymptoms of inflammation, ſtill continue, far from having recourſe to the ſtimulating plan, the practitioner ſhould perſiſt in the antiphlogiſtic regimen. Due caution however ought to be obſerved, not to carry the antiphlogiſtic treatment too far; as the inflammatory ſtate often paſſes quickly away, and torpor of the vital powers ſucceeds. The bark, therefore, and other tonics, though on ſome

occaſions they may be hurtful in the commencement of the diſorder, are always found very beneficial in it's progreſs. If a gaſtric fever be united with the mortification, the *primæ viæ* are firſt to be cleanſed; and afterwards, to ſupport the ſtrength of the patient, the bark and tonics are to be given. If the general relaxation of the vital powers, and a tendency of the blood to diſſolution appear, wine, camphor, ammonia, the bark, the white willow, leopard's bane, &c., are to be employed. The white willow is ſaid to ſurpaſs even the bark in efficacy: but, though I do not in the leaſt doubt it's tonic quality, it ſeems to me very erroneous, to attempt to demonſtrate from experiments made upon veal, and the human blood *, that it poſſeſſes greater efficacy in the cure of putrid diſorders than the bark itſelf; ſince medicines operate in a very different way in a living body to what they do out of it; and thoſe remedies, which beſt prevent putrefaction out of the body, often, when taken internally, enjoy the ſame power only in a ſmall degree. Of this, for brevity ſake, one inſtance will be quite ſufficient. Sir John Pringle obſerves, that to preſerve fleſh from putrefaction, chamomile flowers ſurpaſs the bark in efficacy †: but it is unqueſtionable, that chamomile flowers are not in the leaſt to be compared with the bark in curing putrid diſorders. Hence it is evident, that no concluſion is to be drawn from experiments made either out of the body, or in a dead one, as to the efficacy of any remedy in

* Koning, *Diſſ. de Cortice Salicis albæ, ejuſque in Medicina Uſu*, Harderwyk, 1778, cap. iii.

† L. l. *appendix*, pap. 1, exp. 7, and pap. 2, exp. 13.

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the living ſubject: and the leſs as the antiſeptics only reſiſt the tendency to putrefaction in the animal body, in as far as by ſtimulating the ſolids they rouſe the vital principle into action. If indeed they were to operate by an antiſeptic power, certainly a quantity of vitriolic acid, which would be by no means capable of preſerving a few pounds of fleſh from putrefaction even for one day, would not prove ſufficient to cure a perſon labouring under a putrid fever.

Thus it is evident, of how little weight are the numerous remarks and experiments made upon antiſeptic ſubſtances by Pringle, and what little dependance is to be placed upon the conſequences drawn from them by this eminent phyſician, with regard to the uſe of theſe ſubſtances in different diſeaſes of the human body. If the patient be very irritable and inclined to ſpaſm, the wild valerian, muſk, caſtor, ammonia, and opiates, are to be joined with the tonics. Laſtly, if the irritability be preternaturally augmented in the gangrene, the phyſician muſt likewiſe have recourſe to opium, which, when deemed unable to accompliſh the cure alone, is to be given along with the bark. Thus the cure of mortification ought always to be adapted to the circumſtances.

Nature herſelf effects the ſeparation of the dead parts: for, as ſoon as any part becomes uſeleſs, the abſorbent veſſels are incited to action; a white line is formed, along which the particles exiſting in contact with the dead part are taken up, and thus the groove of ſeparation is produced.

Accordingly, if the power of nature be ſufficient, the phyſician ſhould merely ſtand by as an obſerver: if it need aſſiſtance, he ought to ſupport it; not by topical applications, which certainly can be of little uſe farther than to correct the fetor, being applied to a dead ſurface; but by duly ſtimulating the general ſyſtem by the exhibition of wine and tonics.

With regard to external applications, emollient cataplaſms, or aſtringent lotions, either united with opium, or not, according to circumſtances, are uſeful in the gangrene, when attended with inflammation and much pain: or, according to the preſcription of the celebrated Bell, a weak ſolution of ſal ammoniac in oxycrate may be employed, which, in different caſes, may be rendered more or leſs ſtimulant by the addition of a greater or leſs quantity of ſal ammoniac *. In other caſes a poultice, made with the lees of wine, or of beer; or a decoction of the white willow, or the bark, with the tincture of myrrh, may be uſefully applied to correct the diſagreeable ſmell, and to rouſe the living parts underneath to action.

The healing up of the ulcer, likewiſe, when reduced to a ſimple one, is chiefly to be left to nature; and the practitioner ought only to take care, that nothing diſturbs it's action. He may however quicken the proceſs of nature a great deal by bringing the edges of the ulcer cloſe or near together by means of ſticking plaſter. But in order to reduce

* *Treatiſe on the Theory, and Management of Ulcers*, ſect. iv, § v, p. 115 and foll.

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the mortified part to the ſtate of a ſimple purulent ulcer, various remedies may prove uſeful on different occaſions.

Mortification kills in four ways.

1, By the ſphacelus of ſome organ, the function of which is abſolutely requiſite to life, ſo that the extinction of the vital principle cloſely follows it's mortification.

2, The conſtitution is ſometimes ſuddenly broken down by the violent action of the morbid ſtimulus; in which caſe the patient dies unawares, before any vital part has been affected.

3, The ſame not unfrequently happens, if the noxious ſtimulus have been applied during a long time to any part; and hence the patients often expire after the ſphacelus has been long ſtopped.

4, The abſorbed ichorous matter, unleſs ſubdued by nature, aided by proper medicines, and thus diſcharged from the maſs of blood by the different emunctories, weakens the tone of the ſolids, and incites them into ſuch irregular motions, that a malignant fever is brought on, the ſymptoms of which are extreme relaxation of the general ſyſtem, a weak intermitting pulſe, a propenſity of the fluids to putrefaction, delirium, cold ſweats, offenſive colliquative ſtools, convulſions, coma, &c. The termination of this fever is generally fatal.

CLASS XI.

The Diseases of the Nervous System.

NERVOUS diseases are all those in which the animal functions undergo a change from their healthy state without an idiopathic pyrexy. The neuroses may either originate from a morbid state of the brain and nerves; or they may have their primary seat in other organs, and, on account of the delicacy and irritability of the patient, bring on a general affection of the nervous system. I know, indeed, that Cullen states, as a requisite to the neuroses, their not depending upon a local affection of the organs *. If, however, it be considered, that the diseases of the nervous system, far from being averse to a conjunction with local affections of the organs, very often originate from them; that they are not unfrequently kept up by local disorders alone, so that by the removal of these the affections of the nervous system spontaneously disappear, as is proved by epilepsy, and other convulsive disorders, which are sometimes cured by anthelmintics, aperients, and other medicines, that have not the least effect on the nervous system; that the nervous diseases are, in most cases, complicated with a local affection; and that these diseases, though deriving their origin from local disorders, in process of time become idiopathic, so that, though the cause of the com-

* *Synop. nosolog.* class 2, p. 181.

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plaint be taken away, it's effect, the nervous diſeaſe, remains; it ſeems to me very incongruous, to exclude the ſympathetic nervous diſorders from the claſs of the neuroſes; and the more, as they are very often ſo complicated by nature, that the phyſician is at a loſs to determine, whether it be an idiopathic or ſympathetic nervous diſeaſe; and in other caſes, leaving the local affection to itſelf for a time, muſt turn all his attention to the cure of the nervous diſorder.

All the nervous complaints, though ariſing from very different and even oppoſite cauſes; and though differing in degree of violence, according to the different morbid ſtimuli applied; yet, as to their effects, operate only in two ways, and always produce, in a greater or leſs degree, either atony, or ſpaſm. This claſs therefore, as it were, ſpontaneouſly divides itſelf into two orders; in the firſt of which the functions of the nervous ſyſtem are always either partially or wholly interrupted; whereas in the ſecond an exceſs of the nervous powers, in a lower or higher degree, takes place.

Before I proceed to inquire ſeparately into theſe, I muſt beg leave to obſerve, that it is of ſome importance in the practice of phyſic, to diſtinguiſh properly between the ſympathetic nervous diſorders, and nervous ſymptoms. It is true, indeed, that a great analogy exiſts between them, yet they may be diſcriminated by the following characters.

1, The ſympathetic nervous diſorders do not belong, ſtrictly ſpeaking, to the nature itſelf of the diſeaſe,

diſeaſe, in which they are obſerved: the nervous ſymptoms, on the contrary, are to be looked upon as immediate effects of the morbid ſtate; and by no means to be ſeparated from the malady, on which they attend.

2, The ſympathetic nervous diſeaſes very often change into idiopathic ones: whereas the nervous ſymptoms generally diſappear together with the primary diſeaſe itſelf.

3, In the ſympathetic nervous diſeaſes the phyſician muſt always attend to the nervous diſorder in the cure of the primary diſeaſe; and frequently, leaving the primary diſeaſe to itſelf, he muſt endeavour to remedy the nervous complaint: but the nervous ſymptoms are always cured by ſuch medicines, as the nature of the malady, of which they are the ſymptoms, requires, and are often removed by medicines otherwiſe quite contrary to their nature.

To illuſtrate this by an example I ſhall take the following inſtances.

The convulſions originating from worms, or ſordes in the *primæ viæ*, are ſympathetic nervous diſorders, but by no means ſymptoms, owing to the nature of the diſeaſes themſelves. For theſe nervous complaints chiefly appear, when thoſe diſorders take place in children, women, and men of a weak and irritable conſtitution: whereas, if the ſordes of the *primæ viæ*, or worms, attack ſtrong vigorous men, or perſons of an indolent conſtitution, theſe com-

complaints are totally wanting. An unequivocal ſign, that theſe convulſions are no ſymptoms of the diſeaſes in queſtion, but ought to be imputed to the irritable conſtitution of the patients, in which the nervous ſyſtem readily partakes of the operation of morbid ſtimuli on the general habit. Thus, though in ſuch caſes the nervous ſyſtem itſelf, ſtrictly ſpeaking, is not primarily affected, but only ſuffers by ſympathy, yet a certain irritability of the nervous ſyſtem, and prediſpoſition of it to become morbid, exiſt. Hence it is, that, in the epilepſy ariſing from worms, the wild valerian uſually proves ſo beneficial; becauſe it combines together an anthelmintic, and an anti-ſpaſmodic quality. Nay, though by the uſe of mere anthelmintics the epilepſy is often remedied; ſtill it is always prudent to prevent it's return, by ſtrengthening the nervous ſyſtem; as, if this precaution be neglected, the convaleſcent remain very irritable, and very much diſpoſed to epilepſy, or other convulſive diſorders from very ſlight ſtimuli. The ſame is to be ſaid of the ſordes of the *primæ viæ*, when attended with convulſions: as, after clearing the alimentary canal, the digeſtive organs ſhould be reſtored to their due tone by tonics. In the tetanus, when brought on either by a wound or a fracture, which of the two is to be attended to, the primary diſeaſe, or the nervous ſyſtem ſecondarily affected? Is it not proved, beyond all doubt, that the only way of giving the patients at leaſt a chance of recovery is, to attempt to moderate the irregular and exceſſive motions of the nervous ſyſtem by a free uſe of antiſpaſmodics and ſedatives?

But the caſe is quite different in the nervous ſymptoms. Let us ſuppoſe, for inſtance, that a patient ſhould

ſhould labour under a bilious colic; and that, to remove the nervous ſymptoms, valerian, opium, aſafœtida, caſtor, and other nervous remedies ſhould be adminiſtered: what would be the conſequence? At leaſt an augmentation of all the ſymptoms, and very often an inflammation of the *primæ viæ*, and death itſelf: whereas rhubarb, cryſtals of tartar, tamarinds, &c. though poſſeſſing no power at all over the nervous ſyſtem, will effectually remove theſe ſymptoms.

When on the ſubject of fevers I obſerved, that intermittents, attended with a comatoſe affection of the head, are ſometimes epidemic; and that this comatoſe affection, when not ſpeedily remedied by proper treatment, terminates in a fatal apoplectic fit.

But by what means is the apoplexy in ſuch caſes to be prevented? Do bleeding, a refrigerant regimen, emetics, purgatives, and ſtimulants, prove uſeful for this purpoſe? By no means: on the contrary, a large doſe of opium, a medicine otherwiſe oppoſite to the nature of the apoplexy, prevents the fit from taking place *.

It would be eaſy to add many other inſtances to theſe: but the ſcope of this treatiſe does not permit it; and it is the leſs neceſſary, as the above are quite ſufficient to ſhow the utility of the diſtinction.

* Vogel, l. l. theil 1, kapitel 2, p. 53.

ORDER I.

Atony of the Nervous Syſtem.

GENUS I.

Apoplexy.

Apoplexy is either a diminution, or an abolition, both of the external and internal ſenſes, and of the voluntary motions, attended with a ſtertorous breathing, and the appearance of a profound and continual ſleep, out of which ſtate the patient cannot be rouſed by the application of ſtrong ſtimulants to the organs of ſenſe.

This diſeaſe, though it ſometimes makes it's appearance in youth, generally attacks perſons in an advanced period of life. The prediſpoſing cauſes are a large head, a ſhort neck, a ſanguineous temperament, corpulent habit, and a ſedentary inactive life. The occaſional are a full diet, ſuppreſſion of an uſual diſcharge, frequent intoxication, immoderate exerciſe, the cold bath uſed when the body is hot, violent paſſions of the mind, convulſions, compreſſion of the jugular veins, tumours in different parts of the brain and it's membranes, external violence; in a word, whatever either by inciting the circulation of the blood toward the head, or by putting a ſtop to it's return from that organ, or by any other cauſe, compreſſes the brain and origin of the nerves, or, independent of compreſſion, interrupts the

the functions of the nervous system by destroying it's energy.

In far the greater number of cases the apoplexy arises from an overloaded state of the vessels of the brain, which, being distended beyond their tone by some cause or other, suffer a rupture, so that an extravasation of blood takes place upon one of the membranes of the brain, or into the substance of the brain itself, which, by compressing that organ, puts a stop to it's functions. The attack of the disease is more or less violent in the compound ratio of the degree of effusion and the different susceptibility of the brain in different individuals to be affected by pressure. Indeed it is proved beyond all doubt, that the brain will have it's functions impaired in very different degrees in different persons from the same apparent degree of injury. Whether an overloaded state of the vessels of the brain without extravasation may bring on an apoplexy, is a questionable point. That a congestion of blood in the venous vessels of the head may occasion a comatose state, is in my opinion not to be doubted: for in many cases the malady is preceded by a degree of coma, and various other symptoms, which, when not taken off in time by proper treatment, increase daily more and more, and at length terminate in an apoplectic fit. In these cases the disease seems to originate from an accumulation of blood in the head, which in some measure compresses the brain, the symptoms gradually increase, on account of the vessels becoming daily more and more distended, till at length the over distention is such, that the blood-vessels, being incapable of resisting any

any longer, give way to the preſſing column of blood, and an extravaſation takes place: whereas, if the diſeaſe come on ſuddenly in a conſiderable degree, the exciting cauſes operate ſo violently on the brain as to cauſe an immediate rupture of it's blood-veſſels, on account of their being unable to accommodate themſelves to the large quantity of blood tranſmitted to them in ſuch a ſudden and violent way. It ſeems therefore, that, in caſes where the diſorder comes on gradually, it originates from an overdiſtention of the blood-veſſels of the brain, ultimately terminating in their rupture: but when the diſeaſe comes on very ſuddenly, an effuſion of the blood has taken place directly, in conſequence of the violent operation of the noxious ſtimuli.

Extravaſated blood is the moſt common cauſe of this diſeaſe, as is proved beyond all queſtion, by the numerous diſſections of patients, who died of apoplexy, made by the celebrated practitioners John Hunter, and George Fordyce; the latter of whom found extravaſated blood in every one of the heads of ninety-eight apoplectic patients, who were opened after death. But though the effuſion of blood into the cavity of the ſkull is doubtleſs far the moſt frequent cauſe of apoplexy, yet, from the obſervations of Willis, Morgagni, Valſalva, and Lieutaud, there is ſtrong reaſon to believe, that ſometimes an apoplexy may be brought on by an overdiſtention of the blood-veſſels alone, without extravaſation. Nay it ſeems, that without any compreſſion of the brain at all, on certain occaſions, an apoplexy may ariſe: for Rahn and Valiſnerius record, that, in many diſſections of patients, who were carried off by the diſeaſe in queſtion, neither the leaſt extravaſation of blood,

nor the ſlighteſt alteration of the brain or it's membranes, could be found upon the moſt accurate inquiry. To account for the cauſe of apoplexy in ſuch caſes is very difficult. In all probability the noxious ſtimuli, without firſt operating upon the ſanguiferous ſyſtem, ſometimes directly and immediately act on the brain and nerves, and ſuſpend the functions of the nervous ſyſtem by deſtroying it's energy; though, on conſidering the remote cauſes of the diſeaſe, no doubt will remain, but that moſt of them act by compreſſing the brain.

The proximate cauſe of apoplexy ſeems thus to conſiſt in an interruption of the functions of the nervous ſyſtem, brought on in conſequence either of the brain being compreſſed, or it's energy deſtroyed, by ſome noxious power.

The prognoſis of this diſeaſe is ominous; for though the patient ſometimes entirely recovers from the apoplexy, yet in far the greater number of caſes it has either a fatal termination, or ends in hemiplegia. Even when the conſtitution of the patient has ſtruggled through the diſeaſe, there is commonly a ſtrong diſpoſition to a freſh attack, and the repeated paroxyſms of the apoplexy in general ſooner or later bring on one or other of theſe events. The danger however is more or leſs urgent.

1, According to the cauſes of the diſeaſe. For inſtance, an apoplexy ariſing from burning charcoal, the fumes of mercury, opium, and other narcotic poiſons; and that which originates either from an acute fever, or an epileptic fit, prove almoſt always mortal,

mortal, when in any conſiderable degree. Whereas an apoplexy owing to ſuppreſſed evacuations affords much more hopes of cure, on account of the operation of the noxious power being leſs violent, and the patient's ſtrength uſually not ſo much impaired.

2, According to the violence of the ſymptoms. For, as the cauſes of the apoplexy are *ceteris paribus* proportionate to the violence of the ſymptoms, a high degree of apoplexy ſeldom occurs without a conſiderable effuſion either of blood or ſerum; and when either of theſe is extravaſated in a large quantity, a complete recovery from the diſeaſe is very rare. If therefore a perfect abolition of ſenſe and motion, attended with difficult reſpiration, take place; if there be a difficulty of ſwallowing, and the drink return through the noſe; if the patient frequently ſhould move his hand to a certain part of the head; if the ſaliva foam from the mouth; if partial clammy ſweats, coldneſs of the extremities, and a relaxation of the ſphincters of the anus and bladder, make their appearances; and if, while one ſide of the body is affected with loſs of ſenſe and motion, the other ſide become ſtrongly convulſed; a fatal termination of the diſeaſe is to be expected. If, on the contrary, the functions of the nervous ſyſtem have not been quite aboliſhed; if the reſpiration be pretty eaſily performed; if hemorrhoids; menſes, profuſe ſweats, a copious ſaliva, an increaſed ſecretion of urine, and, in the ſerous apoplexy, a fever, appear; eſpecially if with theſe efforts of nature to get rid of the morbid ſtimulus a di-

minution of the ſymptoms take place; hopes of cure may be entertained.

2, The duration of the malady ſhould likewiſe be taken into the account; for apoplexy is an acute diſeaſe, and when not ſpeedily remedied, it uſually has a fatal termination. Macbride obſerves, that there are hopes of perfect recovery, if the functions of the nervous ſyſtem be in a conſiderable degree reſtored within four days; but that, if the diſeaſe be little diminiſhed within this period of time, very ſmall hopes remain, and the apoplexy uſually ends in death, or in an incurable hemiplegia *.

4, Laſtly the age and conſtitution of the patient ſhould be duly attended to in the prognoſis: for perſons of an advanced period of life ſeldom entirely recover; and thoſe who are of a phlegmatic indolent habit, weak pulſe, with an univerſal tendency to dropſy, are moſtly carried off by the diſeaſe, on account of the general relaxation and debility of the ſyſtem.

Writers on the practice of phyſic generally diſtinguiſh this diſeaſe into two kinds, the ſanguineous and the ſerous apoplexy. If by the latter they wiſh to expreſs, that perſons of an advanced period of life, and of a cold indolent phlegmatic habit, who have either indulged in frequent intoxication, or are weakened by other morbid cauſes, in conſequence of the general debility and relaxation of the ſyſtem, ſometimes contract an univerſal tendency

* L. 1. vol. ii, book vi, chap. i.

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to dropſy, a leucophlegmatic habit attended with a greater or leſs degree of coma; and that this morbid ſtate of the body, when not remedied by proper means, ſooner or later terminates in an apoplectic fit, by which the patients are moſt frequently deſtroyed, on account of a quantity of ſerum being effuſed into the head; I will not cavil about the propriety of the denomination; as it is well known, that an effuſion of ſerum into the cavity of the ſkull ſometimes happens from a hydropic diatheſis prevailing in the ſyſtem; and that a general dropſy not unfrequently terminates in apoplexy. I muſt only remark, that this apoplexy is not idiopathic but ſymptomatic, occaſioned by the prevailing hydropic or leucophlegmatic diatheſis of the ſyſtem. If, on the contrary, by the term ſerous apoplexy it is to be underſtood, that the true idiopathic apoplexy happening to healthy perſons is to be diſtinguiſhed into two kinds, ſanguineous and ſerous, I am very much diſpoſed ſtrongly to deny the exiſtence of ſuch a ſerous apoplexy, except in books; for I cannot comprehend, how this effuſion of ſerum can take place in a healthy conſtitution. I have twice had an opportunity of obſerving the ſerous apoplexy: but in both caſes the health was very much impaired, and there were evident ſigns of a general debility and relaxation of the ſyſtem; a leucophlegmatic habit, and an univerſal tendency to dropſy, previous to the fit. Even if we conſult the moſt eminent practitioners on the ſubject, it will appear, that they have made this diſtinction more through deference to cuſtom and the authority of the ancients, than from their own obſervations. Burſerius and Cullen, though they make uſe of the common diſ-

tinction of apoplexy into ſanguineous and ſerous, yet obſerve, that both kinds often depend on a venous plethora, and require very nearly the ſame method of cure. Morgagni is not only of the ſame opinion, but alſo records an inſtance of a man of an advanced age, who was ſuppoſed to have died from a ſerous apoplexy, in whoſe head a large quantity of extravaſated blood was found *. Quarin goes ſo far as to ſay, that a true ſerous apoplexy ſeldom takes place; and that in all caſes, where the pulſe and ſtrength of the patient admit of it, recourſe ſhould be had to veneſection †. Inſtead, therefore, of employing the common diſtinction of this diſeaſe into the ſanguineous and ſerous, which certainly cannot be very uſefully applied in practice, and gives riſe to the general errour of the too free and early uſe of volatile and heating remedies, I ſhall divide the apoplexy into idiopathic and ſymptomatic, for the treatment of both which I ſhall attempt to lay down general rules.

The treatment of apoplexy, whether idiopathic or ſymptomatic, is to be conducted upon three general indications.

1, The apoplexy ſhould be prevented, if poſſible.

2, The removal of the exiſting diſeaſe is to be attempted by the moſt active means, on account of the uſual violence and fatality of the complaint.

* L. 1. epiſt. iv. art. 21 & 22.

† L. 1. cap. i. p. 5 & 11.

3, The

3, The diſpoſition of apoplexy to return is to be kept off by a ſuitable regimen.

Theſe indications are accompliſhed by different remedies, in the different ſpecies of the diſeaſe, each of which requires therefore to be ſeparately conſidered.

The idiopathic or ſanguineous apoplexy is in many caſes preceded by various ſymptoms, ſuch as frequent fits of giddineſs, headache, hemorrhage from the noſe, a red, fluſhed, and bloated countenance, the veins of the head, neck, and under the tongue, turgid, the eyes protuberant and ſuffuſed with tears, ſtridor dentium, tinnitus aurium, ſome tranſitory interruptions of ſeeing and hearing, tremor and numbneſs of the extremities, torpor of the ſenſes, an impediment of the ſpeech, loſs of memory, unuſual ſleepineſs, frequent fits of incubus, frightful dreams, in which every thing appears to the patient red coloured by falſe viſion, the urine is alſo frequently red, the reſpiration ſlow and difficult, and the pulſe is ſlow, full, hard, and generally very ſtrong.

The idiopathic apoplexy ſhould be prevented, in caſes where it's attack is immediately threatened, by a copious bleeding from the jugular vein or temporal artery. But when the diſeaſe has not advanced ſo far as to endanger an immediate attack, bleeding is rather to be omitted; for it ſhould always be conſidered, that veneſections, as far as they are compatible with the healthy actions of the digeſtive organs, and when not carried beyond a certain point, have a tendency to increaſe the ple-

thora, of courſe require frequently to be repeated, and thereby induce ſuch an irritability and debility of the general ſyſtem, that the veſſels cannot afterwards bear even a very ſlight ſuperabundance of blood; and ſtimuli, which would have no effect at all upon ſound vigorous perſons, prove morbid to ſuch individuals. Since a habit like this is not very comfortable, and may be attended with much danger, it is much better to obviate the plethora, by moderate bodily exerciſe, either by riding on horſeback or walking; by uſing a regular, abſtemious, and ſomewhat low diet, eſpecially with regard to ſupper; by abſtaining from all ſtrong ſtimulating liquors, and, unleſs the patient have long been accuſtomed to the uſe of wine and porter, in which caſes he may be indulged in a moderate quantity of either, ſmall beer, or mineral waters, ſhould be his common drink.

As evacuations by ſtool certainly contribute a great deal to relieve the plethoric ſtate of the veſſels of the head, coſtiveneſs is to be carefully avoided; the body is conſtantly to be kept regular, or rather open, by gentle laxatives; and upon any appearance of an unuſual turgeſcence, eſpecially in the ſpring, a briſk purgative of calomel and rhubarb is to be preferred to gentle laxatives, in order to produce more effectually a determination to the bowels, and this ſhould occaſionally be repeated in all caſes, where there is a ſtrong tendency to apoplexy. The free uſe of tobacco in any ſhape is to be avoided, as there are inſtances on record of perſons, who died of apoplexy contracted merely from the abuſe of this plant. With theſe means, which, when uſed ſufficiently early,

early, will generally prove effectual to prevent the diſeaſe, the application of ſome leeches to the temples may be uſefully combined, in caſes where evident ſigns of any unuſual turgeſcence of the veſſels of the head appear; as the uſe of theſe is not attended with the injurious conſequences often ſucceeding to general bleedings.

The next thing to conſider is, what ought to be done, when the apoplexy immediately ſucceeds the application of the exciting cauſes, ſo that there is no opportunity for preventing the diſeaſe. In all caſes of idiopathic apoplexy, recourſe is to be had to a free uſe of the lancet. The quantity of blood to be drawn ought no doubt to differ according to the pulſe, ſtrength, and age of the patient; yet a large bleeding proves always uſeful, and is to be immediately employed, for the ſooner the compreſſion of the brain is removed, the more chance there is of recovering. The veneſection will be moſt effectual, when the blood is taken from the jugular vein, or temporal artery; for it is at preſent clearly aſcertained, that, in all affections of the head, bleeding from theſe veſſels affords more relief than a much larger quantity taken from the arm. It is likewiſe far from a matter of indifference in all caſes from which ſide the blood is drawn: for when one ſide of the body is more affected with the loſs of motion than the other, the veneſection ſhould be made on the ſide oppoſite to that moſt affected; ſince diſſections ſhow, that the hemiplegia is always upon the oppoſite ſide of the body from that of the brain, in which the effuſion of blood has taken place. The opening of the occipital veins

by cupping the back part of the head with deep ſcarifications, and the application of ſeveral leeches on the temples, may be uſefully joined with the general venefection.

It is alſo proper, to attempt to relieve the veſſels of the head, by producing a determination to the bowels; which may be immediately done by ſtimulating the *primæ viæ* by acrid glyſters; and, if the patient have any power of ſwallowing, draſtic purgatives ſhould likewiſe be given by the mouth. Briſkly operating purges here juſtly claim the preference on account of the violence of the complaint. Vomiting has likewiſe been recommended: but this practice is highly to be reprobated on account of the great violence with which it impels the blood into the veſſels of the head. Burſerius witneſſed ſeveral caſes, in which a ſlight hemiplegia changed into a violent apoplexy, and a vehement one terminated fatally within a few hours, on the exhibition of an emetic*.

Another very powerful remedy in removing the apoplexy, to which the practitioner ſhould always have immediate recourſe, is bliſtering. The bliſters are uſually applied between the ſhoulders; but they prove much more effectual, when applied to the head itſelf. Bliſters ſeem to operate partly by making a revulſion, and partly by rouſing the vital principle into action by their ſtimulant power. To make the revulſion more conſiderable, ſinapiſms and epiſpaſtics may be applied to the lower extre-

* L. l. t. iv. cap. iv. p. 107.

mities

mities at the ſame time; and pediluvia may likewiſe be uſed. Tiſſot was very averſe to the uſe of bliſters in the ſanguineous apoplexy, being extremely apprehenſive, that they would do harm to the patient by their ſtimulant power; as he had once obſerved, in an elderly lady, that an apoplexy, which was in a great meaſure abated by veneſection and purging, terminated fatally on the application of bliſters*. But no general rule can be drawn from this ſolitary inſtance. It is well known, that bliſtering, inſtead of exaſperating the complaint, generally has a conſiderable ſhare in removing it: and there is the leſs room for apprehenſion from the ſtimulating effects of bliſters, if they be employed, when I think they may with moſt advantage, after the veſſels of the head have been ſufficiently unloaded by a copious bleeding from the jugular vein or temporal artery.

It ſhould be obſerved, as a general rule, that in all ſpecies of apoplexy the patient is to be kept as much as poſſible in an erect poſture, and in cool air; the patient's chamber therefore ſhould be kept very cool; perſons who are diſpoſed to apoplexy, or have laboured under this complaint, ought likewiſe always to live in a cool air, and to ſleep in a ſomewhat upright poſture, with the head elevated, in order to prevent the accumulation of blood in the veſſels of the brain.

Some practitioners, together with the remedies already mentioned, recommend the uſe of ſtimu-

* *Epiſt. var Argument. ad Haller*, p. 65.

lants

lants of various kinds; but ſound reaſoning alone is ſufficient to prove, that, wherever the apoplexy depends upon a plethoric ſtate of the veſſels of the head, as is invariably the caſe in the idiopathic apoplexy, ſuch remedies muſt be very improper. This is fully confirmed by experience; ſince Cullen, Quarin, Morgagni, Burſerius, and other celebrated practitioners, all agree, that the uſe of ſtimulants is highly to be reprobated, and ſuch remedies uſually do a great deal of miſchief. After the patient returns to his ſenſes, the body ſhould be kept open by neutral ſalts, and cooling and aceſcent purgatives.

The return of the apoplexy is to be obviated by having recourſe to the remedies we have recommended for it's prevention; but, on account of the ſtrong tendency patients, who have once laboured under the diſeaſe, generally have to a relapſe, in addition to the above means ſetons or iſſues, producing a diſcharge of pus from the neighbourhood of the head, may be very uſefully employed in obviating the plethoric ſtate of the veſſels of the head. Beſides, as plethora is not only compatible with a certain degree of weakneſs and irritability of the ſyſtem, but alſo not unfrequently originates from general debility; it is evident, that in many caſes a moderate uſe of tonics, and a nouriſhing diet, may prove efficacious in preventing the apoplexy, and that every thing, that has a tendency to induce a debility of the general habit ought carefully to be avoided.

The ſymptomatic apoplexy may ariſe from different cauſes, to the nature of which the treatment

is

is to be ſuited. If it ariſe from a hydropic diatheſis of the ſyſtem, that is, if a ſerous apoplexy take place, the diſeaſe is always preceded by a morbid ſtate of the body, and by various ſymptoms, ſuch as unuſual heavineſs, head-ache, vertigo, ſome faultering of the tongue in ſpeaking, coldneſs of the extremities, loſs of memory, torpor of the ſenſes, a countenance pale and bloated, or of an eryſipelatous redneſs, and ſoft to the touch, ſwollen and watery eyes, difficult reſpiration, falſe viſion and hearing, frightful dreams, in which the patients fancy themſelves ſuffocated by water or ſnow, a leucophlegmatic habit, a weak ſlow pulſe, and an univerſal tendency to dropſy. Indeed this apoplexy is ſo ſtrongly marked by the ſymptoms mentioned, that a practitioner can never be at a loſs to know when it's approach is to be apprehended.

It is a happy circumſtance, that the ſerous apoplexy may be foreſeen a long time before it's attack, as thus we are enabled to attempt it's prevention by proper means; for if the ſerous apoplexy be produced, the diſeaſe has almoſt invariably a fatal termination, and the patient is not unfrequently ſo ſoon deſtroyed, that there is no opportunity left for trying any remedy. Even though the phyſician is called in ſufficiently early before the attack, he will often find it a matter of great difficulty, to prevent the apoplectic fit from taking place, on account of the debility and relaxation of the general habit, which are conſtant attendants of this ſpecies of apoplexy; and moſt frequently the diſeaſe proves obſtinate to all remedies, and ends ſooner or later in death, or in hemiplegia.

For

For the prevention and cure of the ſerous apoplexy, ſome writers recommend the application of leeches, or bleeding by cupping glaſſes. With what view remedies of this kind are to be uſed is difficult to ſay; for in theſe caſes there is rather a want of blood, than a ſuperabundance; and ſuch remedies certainly cannot have the leaſt influence either in preventing an effuſion of ſerum into the ſubſtance of the brain, or curing it when exiſting. Moſt practitioners are very fond of active emetics, and draſtic purgatives, with intent to expel the ſerous humour from the body. Indeed the evacuating plan forms the chief part of the common practice in this diſeaſe. As, however, the ſerous apoplexy originates from a conſiderable degree of debility and relaxation of the general habit, and the frequent repetition of powerful emetics and briſk purges muſt doubtleſs have a ſtrong tendency to weaken the body a great deal more, the propriety of ſuch a practice may juſtly be doubted; the more, as the common method proves very generally unſucceſsful, the patient becomes more and more weakened, the ſymptoms daily increaſe, and death for the moſt part cloſes the ſcene.

In this ſpecies of apoplexy, therefore, after cleanſing the *primæ viæ* by an active emetic and a briſk purge; though no doubt the alimentary canal is always to be kept clean by the occaſional exhibition of calomel and rhubarb; the chief treatment ſhould conſiſt in rouſing into action the ſyſtem at large, and the abſorbents in particular, by putting the patient upon the ſtimulating plan. A large bliſter is to be applied to the head; ſtimulating the lower extremities by epiſpaſtics, ſinapiſms, and bliſters themſelves,

themſelves, is adviſable; and a bliſter may likewiſe be put between the ſhoulders. Internally, recourſe ſhould be had to muſk, valerian, aſafœtida, camphor, ammonia, leopard's bane, bark, ſnake-root, wine, and the whole tribe of ſtimulants, in order to remove the cauſe of the diſeaſe by ſtrengthening the general habit. As, on account of the weakneſs of the ſtomach and bowels, the patients in general will not bear theſe remedies in ſubſtance, they are to be given in decoction, infuſion, or mixture. This treatment, it is true, is not yet ſanctioned by experience; but, as the common method of practice ſo generally fails, I am, I truſt, perfectly juſtified in recommending another, which, being founded on the nature of the diſeaſe, gives at leaſt hopes of ſucceſs.

After recovery, the return of the ſerous apoplexy is moſt effectually prevented by reſtoring the ſyſtem to it's due tone, by bark, bitters, ſteel, chalybeate waters, moderate exerciſe, and a nouriſhing diet.

When on the ſubject of fevers we mentioned a kind of intermittents, that were very dangerous on account of their being attended with a comatoſe ſtate, which, when not ſpeedily remedied, uſually ended in a fatal apoplectic fit. To prevent this unhappy termination, a large doſe of *laud. liq. Sydenh.*, or tinctura opii, given during the attack, proves very uſeful. It is very probable, that a bliſter, applied to the head a ſhort time before the acceſſion of the cold fit, would likewiſe powerfully counteract this tendency to apoplexy, by taking off the ſpaſmodic diſpoſition of the veſſels of the head, which ſeems to occaſion the accumulation of

blood in this organ. Glysters with tincture of opium and asafœtida should likewise be tried in these cases. Lastly, in the interval between the paroxysms, the return of the fit is to be prevented by giving large doses of bark.

If the apoplexy be brought on by external violence, a large quantity of blood is to be taken from the jugular vein or temporal artery, and the bowels of the patient are to be cleared by glysters, and purges given by the mouth. If the symptoms of compression of the brain should not give way to this treatment, recourse is immediately to be had to the operation of trepaning, as here waiting is attended with much danger. The trephine should likewise directly be applied, if any depression of the bones of the skull take place, though the symptoms of compression of the brain do not make their appearance; since experience has proved, that these often do not come on till several days after the injury; and that, to delay the operation till the symptoms of compression arrive, frequently proves fatal to the patient.

If the apoplexy be the consequence of the taking of narcotic poison, or the inhaling of carbonic acid gas; the remedies above recommended to counteract their poisonous effects on the constitution, are to be employed. But, as dissections of such bodies have shown, that in these cases the blood is always accumulated in a considerable quantity in the vessels of the head, and most frequently even an extravasation of blood into the substance

ſubſtance of the brain takes place *, in addition to thoſe means bleeding freely from the temporal artery or jugular vein will always be adviſable, in order effectually to relieve the plethoric ſtate of the veſſels of the head.

When the apoplexy is produced by a tranſlation of the gout or rheumatiſm to the head, if the patient be plethoric, and the pulſe full, hard and ſtrong, veneſection and the antiphlogiſtic treatment are to be put in practice. If, on the contrary, the pulſe be ſoft and weak, and the conſtitution of the patient broken down by the previous diſeaſe, bliſters applied both to the head and lower extremities, and muſk, camphor, ammonia, and aſafœtida given internally, are the moſt likely means of relieving the patient. Our reſources however are very precarious in theſe caſes, and the ſituation of the patient is always dangerous in the extreme; for moſt frequently death arrives within a few hours.

With regard to the manner, in which life is deſtroyed in this diſeaſe, the patient is not unfrequently cut off at once by the violence of the attack. Often, however, the noxious ſtimuli do not act with ſuch force as to kill immediately, but only induce an apoplectic ſtate, which may be protracted for ſome time. In this caſe the apoplexy is often attended with convulſive motions owing to the vain efforts nature makes to relieve herſelf; but all the aſſiſtance the phyſician can give being inſufficient

* Portal, *Hiſt. de l'Acad. des Sciences, ann.* 1775.

to

to enable her to get rid of the noxious ſtimulus, the patient ſinks under the complaint, and death cloſes the ſcene.

When the apoplexy does not terminate fatally, the diſeaſe ſeldom admits a complete recovery, but ends in hemiplegia: and as palſy, though it may ariſe from many other cauſes, is frequently the conſequence of an apoplectic fit, it will not be amiſs to introduce the ſubject here.

GENUS II.

Palſy.

Palsy is the total loſs or diminution of motion, or of ſenſation, or of both, in one or more parts of the body. The diſorder has different names according to the parts affected. One of it's moſt frequent forms is when it affects the whole of the muſcles on one ſide of the body, and is called hemiplegia.

It is ſomewhat difficult to render an account, why in one caſe the feeling of the part only is affected; while in another the power of motion is deſtroyed; and in a third both ſenſation and motion are quite loſt. Some phyſiologiſts, in order to explain it, have ſuppoſed, that there exiſt two ſets of nerves, one for motion and another for ſenſation. But this hypotheſis may eaſily be refuted on anatomical grounds.

grounds. The diſſection of every body will teach us, that the ſame nerves preſide over both motion and ſenſation; and when the nerves going to the extremities are tied, or cut, both the ſenſation and motion of the parts are loſt. It ſeems, therefore, more reaſonable to ſuppoſe, that the ſame nerves ſerve both for ſenſation and motion, but that according to the different manner of operating of the noxious ſtimuli, either ſenſation, or motion, or both are loſt. In both the former caſes an incomplete, and in the laſt a complete palſy takes place.

The remote cauſes of palſy are whatever may put a ſtop either to the functions of the nervous ſyſtem in general, or to the nerves of the affected part in particular, by preſſure; or may deſtroy their action, by it's violent operation.

The proximate cauſe of palſy is the partial or complete interruption of the function of the nerves in the affected part, in conſequence either of preſſure, or injury to their ſtructure.

The prognoſis is always very doubtful in this diſeaſe. The degree of the malady, it's duration, it's cauſe, the parts affected, and the conſtitution and age of the patient, ſhould all be taken into conſideration. It is uſually only the ſlighter degrees of palſy, and where the diſorder exiſts in it's incomplete form, in which we may entertain hopes of a radical cure. Recent caſes, *ceteris paribus*, yield more readily to the power of phyſic, than thoſe of a long ſtanding; a palſy originating from apoplexy moſt frequently terminates in a fatal

apoplectic fit. The diſorder is ſeldom cured when depending on preſſure of the ſpine, or when it comes on in conſequence of any external injury of the head. The paralytic affections of the parts near the head, and of the upper extremities, are in general more difficultly removed, than thoſe of the lower extremities: the reaſon of which ſeems to be, that the nerves of thoſe parts, being of a more delicate ſtructure, may be more violently affected by the morbid ſtimuli; and that, the tone of delicate organs being once deſtroyed, it is leſs eaſily reſtored than in thoſe of a more firm texture.

The cure of palſy is to be founded on general principles. If the diſeaſe ſucceed to the idiopathic apoplexy, the pulſe be full and ſtrong, and the patient of a plethoric habit, the ſame treatment, as recommended for the apoplexy, will likewiſe here be uſeful. If, on the contrary, the diſeaſe have ſubſiſted for ſome time, and a loſs of appetite, emaciation, and debility of the general habit, accompany it, the tonic plan, bitters, bark, ſteel, and the cold bath, are to be employed. In palſies brought on by narcotic powers, the warm bath has often been of ſervice. When no cauſe appears, and the patient is of a cold, indolent, phlegmatic temperament, aſafœtida, the extract of the rhus radicans, ammonia, arnica, muſtard-whey, guaiacum, tinctura cantharidis, flores lavendulæ, camphor, and the whole tribe of ſtimulants, ſhould be tried. Vomits alſo have ſometimes been uſeful; and recourſe may be had to electricity, applied with a moderate force, with advantage. Bliſters, epiſpaſtics, volatile liniment, camphor, Barbadoes tar,

oil

oil of turpentine, ſpir. vini, or ung. citrinum, are externally to be applied at the ſame time. The diet of the patient ſhould be nouriſhing, and all ſexual intercourſe is to be prohibited. Indeed venery alone is capable of counteracting all our endeavours to cure the diſeaſe, on account of the violent ſhock it gives to the conſtitution, and the ſtrong tendency it's frequent repetition has to weaken the nervous power. But though by the remedies here mentioned, when properly adapted to the patient's conſtitution and the cauſe of the diſeaſe, the palſy may be happily remedied in many inſtances, we are not acquainted with any practice, that certainly or even generally proves ſucceſsful; and frequently, after having tried the whole claſs of ſtimulants, both internally and externally, the phyſician will have the mortification to leave his patient in the ſame condition in which he found him.

ORDER II.

Spaſm.

Spasm is a violent and involuntary action of the muſcles. This is named tonic ſpaſm, if the muſcles remain contracted, and the affected parts be immoveable: but if the contractions continually alternate with relaxation, it is called clonic ſpaſm. From each of theſe kinds I ſhall ſelect one ſpecies.

GENUS I.

Tonic Nervous Diſeaſes.

SPECIES I.

Tetanus.

TETANUS is a fixed, involuntary, and painful contraction of almoſt every muſcle of the body.

In ſome caſes, where the body is drawn forwards, this diſeaſe is called emproſthotonos; when, on the contrary, the body is bent backwards, the diſorder is named opiſthotonos; when particularly affecting the muſcles ſubſervient to the motion of the jaw, and thoſe about the neck, the diſeaſe is called the locked jaw, or triſmus. But all theſe are only different forms of one and the ſame diſeaſe, and require the ſame treatment.

Though the diſeaſe affects all ages, ſexes, temperaments, and complexions, yet it more frequently attacks children and perſons of a middle age, the male ſex more than the female, and robuſt and vigorous men more than the weaker. The malady may occur from certain cauſes in every climate: it particularly prevails however in the warmeſt climates, during the rainy ſeaſons. The exciting cauſes are ſudden viciſſitudes of heat and cold; cold and moiſture applied to the body, while it is very warm; ſleeping in the open air, eſpecially in a damp place;

place; wounds, luxations, fractures, punctures, or laceration either of a nerve or a tendon; ſordes of the *primæ viæ*, worms, &c.

The proximate cauſe of tetanus ſeems to be a certain and determinate diſturbance of the functions of the nervous ſyſtem; though wherein this conſiſts, or what prediſpoſition of the body is requiſite, in order that the exciting cauſes may produce the diſeaſe, we are hitherto quite ignorant. A tender and irritable conſtitution prediſpoſes in general to nervous diſeaſes; but the prediſpoſition to the complaint in queſtion cannot poſſibly be imputed to the natural tenderneſs and irritability of the conſtitution; for it is a common obſervation, that robuſt and vigorous men are more liable to the diſorder than delicate females. Mr. Heurteloup, a french ſurgeon, ſuppoſes indeed the proximate cauſe of tetanus to be a relaxation of the ſolids*: yet the remote cauſes of the diſeaſe, and the conſtitutions chiefly attacked by it, clearly ſhow, that this author is miſtaken, and that he has confounded the cauſe of the malady with it's effects, which are always a relaxation and debility of the ſolids.

As we are thus unacquainted with the prediſpoſing cauſes of the diſeaſe, I cannot enter upon the pathology of the complaint. For the ſame reaſon no general rules of practice, founded upon the nature of the diſeaſe, can be laid down; but I muſt be ſatisfied with communicating what experience has taught with reſpect to the prognoſis and

* *Precis ſur le Tetanos des Adultes*, Paris, p. 12.

treatment of tetanus, after having firſt given the hiſtory of the diſeaſe.

The diſorder ſometimes comes on ſuddenly to a violent degree; but more frequently, eſpecially in our temperate climate, it approaches by ſlow gradations to it's violent ſtate. In theſe caſes the courſe of the diſeaſe is generally the following. Firſt, there is a ſenſe of ſtiffneſs and rigidity in the back part of the neck, which, gradually increaſing, renders the motions of the head difficult and painful: then an uneaſy ſenſation about the root of the tongue, and a difficulty of ſwallowing; a violent pain at the lower end of the ſternum, thence ſhooting into the back; the muſcles ſubſervient to the motion of the lower jaw become affected with a violent ſpaſm, and ſhut the teeth ſo cloſely together, as not to admit even of the ſmalleſt opening; a greater number of muſcles gradually partake of the ſpaſmodic affection; the trunk of the body is ſometimes bent ſtrongly backwards; in other caſes, but more ſeldom, it is drawn violently forwards; the muſcles of the lower extremities being affected with ſpaſms, keep the limbs rigidly extended; during the whole courſe of the diſeaſe the abdominal muſcles are ſo violently affected with ſpaſm, that the belly is ſtrongly retracted, and feels hard as a piece of ſtiff leather. Though in the very commencement of the diſeaſe all the muſcles partake more or leſs of the ſpaſmodic contraction, yet at firſt the extenſors are uſually the parts moſt ſtrongly affected; but in the more advanced ſtages of the complaint the flexors become affected with equal violence. Hence the head and trunk grow rigid, inflex-

inflexible, and admit not of the leaſt motion any way. The upper extremities, little affected before, are now likewiſe rigidly extended. Theſe ſpaſms are every where attended with acute pains. The utmoſt violence of ſpaſm ſubſiſts however only for a minute or two, and is ſucceeded by ſome remiſſion both of the contraction of the muſcles and of the pain: but from time to time the violent contractions and pains are renewed, ſometimes every ten or fifteen minutes. During the violence of the ſpaſm, the pulſe is hurried and irregular, and the reſpiration quick and difficult; but the ſpaſm remitting, in moſt caſes the pulſe and reſpiration return to their natural ſtate. At the height of the diſeaſe not only all the muſcles ſerving to the voluntary motions, but likewiſe thoſe of the vital and natural functions, are more or leſs affected. The ſpaſms now become ſo frequent and violent, that ſcarcely any remiſſion can be obſerved: the heart beats with ſuch force, that it's motions are often perſpicuous even through the clothes: the evacuations, both by ſtool and urine, are in a great meaſure ſuppreſſed: the face is frequently pale, with a cold ſweat over the whole body; though ſometimes, on the contrary, the face is flushed, attended with profuſe warm ſweats; a delirium ſometimes comes on; nay, from the repeated ſhocks given to the conſtitution by the violent ſpaſms, every function of the body is greatly diſordered: the muſcles of the face partake of the general affection; the forehead becomes wrinkled; the eyes are uſually fixed and immoveable; the cheeks are drawn backwards towards the ears, and the whole countenance

expreſſes the moſt violent grin. At length a ſevere convulſive fit carries off the patient.

The prognoſis of tetanus is always ominous: ſince, though recovery from the diſeaſe ſometimes happens, in general it has a fatal termination. The diſorder however is more or leſs dangerous:

1, According to it's cauſe. For when ariſing from cold or worms, it is generally more eaſily to be remedied, than when proceeding from injuries of the nerves or tendons.

2, When the diſeaſe comes on gradually, and is ſlow in it's progreſs, much greater hopes of cure may be entertained, than when the malady comes on ſuddenly to a violent degree.

3, The age of the patient, and the parts affected, are likewiſe to be taken into the account, as the triſmus naſcentium, as it is called, almoſt invariably proves fatal; and when the tetanus particularly affects the thorax, it is very dangerous, becauſe the function of reſpiration is then not to be performed without the greateſt difficulty*.

4, The duration of the diſeaſe is to be conſidered. If it come on ſuddenly, the patient frequently dies within forty-eight hours: when the malady has paſſed beyond the fourth day, it is generally leſs dangerous; though the diſorder, after being conſiderably abated, not unfrequently returns with it's former violence, and ultimately deſtroys the patient, even many days after the fourth.

* Heurteloup, l. ſ. p. 21.

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From the great danger attending the diſeaſe, when it has arrived at it's violent ſtate, it will readily appear, that our care and attention ſhould be chiefly directed to watch the complaint on it's firſt appearance. Indeed where the malady gradually approaches to it's height, the diſorder may very frequently be ſtopped in the commencement, by evacuating the *primæ viæ* with calomel and rhubarb, and by a free uſe of opium: but the patient ſhould abſtain from wine, and all other ſtrong liquors, as they are highly injurious. When the diſeaſe has made conſiderable progreſs, and the tetanus is come on; if the malady ariſe from a puncture or laceration of a nerve or tendon, the wound ſhould be enlarged, in order to remove all tenſion exiſting there. If the *primæ viæ* be filled with ſordes, the firſt ſtep to be taken towards the cure is effectually to clear the alimentary canal from it's contents by a glyſter; after which we ought to attempt to remove the morbid irritability of the nervous ſyſtem by every poſſible means; ſince the uſual violence and fatality of the complaint do not admit of an inquiry into it's cauſe. The remedies, which have anſwered this purpoſe, at leaſt in ſome caſes, are the following.

1, Opium, given in large doſes, or in moderate ones frequently repeated. Theden, ſurgeon-general to the army of the late king of Pruſſia, records ſeveral caſes of tetanus, in which opium has been given with ſucceſs *. Home has ſeen tetanus quickly give way to the uſe of opium, after all other reme-

* *Neue Bemerkungen und Erfahrungen zur Bereicherung der Wundarzneykunſt, Erſter theil,* ſeite 149.

dies

dies had been tried in vain *. Parr cured an opiſthotonos by exhibiting more than twenty grains of opium within the ſpace of twenty-four hours †. Huck, Winſlow, Hilary and others, likewiſe found opium very uſeful in this diſeaſe ‡. And probably opium would have been equally ſucceſsful in many other caſes, if it had not been too ſparingly employed from the timidity of practitioners. There is the leſs reaſon for being ſparing in the exhibition of it; ſince experience has proved beyond all doubt, that in tetanus opium does not produce coma, intoxication, or delirium, which it frequently does in other diſeaſes, when much ſmaller quantities have been given. This remedy therefore ſhould be immediately and largely adminiſtered upon the firſt approach of the diſeaſe, in order to bring a ſufficient quantity of it into the ſyſtem before deglutition becomes difficult; and though the quantity of opium to be taken ought doubtleſs to differ conſiderably according to the circumſtances, yet it is by no means uncommon, to give a drachm of opium in the courſe of twenty-four hours. Indeed I have myſelf ſeen two patients recovered by large doſes of opium given at ſhort intervals: though it is to be obſerved, that bliſters were uſed at the ſame time.

2, Large doſes of bark and wine. Theſe have been very ſucceſsfully employed by Dr. Ruſh of Philadelphia againſt this diſeaſe. The celebrated phyſician Plenck likewiſe has lately proved by

* *Principia Medicinæ*, ſect. vi.

† *Med. Obſ. and Inq.* vol. iv, art. vii, p. 98.

‡ Burſerius, l. l. vol. i, cap. viii, p. 238.

ſeveral

ſeveral caſes, that bark is a powerful remedy againſt the tetanus; eſpecially when the patients are either of a weak conſtitution, or the diſeaſe ariſes from gangrenous wounds, or after amputations; in a word, in all caſes, where the malady originates from general debility. Nay this author goes ſo far as to aſſert, that in the above caſes the bark ſurpaſſes even opium in efficacy; as ſome had been cured by opium given only to three grains a day, in conjunction with the bark; while others, though taking opium alone as far as twelve grains in the ſame ſpace of time, were carried off*.

3, Mercury. This has lately been employed with ſucceſs. It is generally adminiſtered by unction, ſo as ſpeedily to bring on ſalivation. Mr. Heurteloup has frequently ſeen the complaint ſpeedily yield to mercurial frictions, without any internal remedy being exhibited at the ſame time †. Plenck alſo mentions two caſes, in which the diſeaſe was happily removed by mercurial unction, after both the opium and bark had been given in vain ‡.

Both the warm and cold bath have occaſionally been employed with advantage in this diſeaſe, eſpecially in conjunction with one or more of the medicines above recommended. I think, however, that in all caſes, where the diſeaſe does not originate from debility, the warm bath, applied of ſuch a temperature as to relax the body, is the moſt uſeful.

* *Act. Acad. Cæſar. Reg. Joſeph. med. chirurg. Vindobonens*, T. i, p. 63 & ſeq.

† L. l. p. 32. ‡ L. l. p. 53.

Blisters are usually reckoned injurious. But, I believe, this is owing to mere prejudice. In the only two cases of tetanus I have seen, in which the patients did well, blistering had a considerable share in the recovery; and I have no doubt, but blisters may be employed in this disease with great advantage.

When deglutition is impeded, bark and opium should be thrown up by glysters.

But though tetanus is sometimes cured by the above remedies, it must nevertheless be acknowledged, that, whatever plan has been pursued, the disease, in most cases, has proved fatal. I would therefore advise the practitioner, when, after the free exhibition of opium and bark, and the use of mercurial frictions, blisters, and tepid bathing, the disease does not seem to give way, instead of persisting in the use of them, to have recourse to other remedies. Belladonna, cicuta, extractum saturni, and the different preparations of arsenic, seem particularly to claim a trial; since the antispasmodic power of these remedies in curing other nervous diseases are beyond all doubt. At any rate, when the usual remedies have been tried in vain, it is better to give the patient at least a chance of saving his life by trying a new remedy, than to let him die without attempting any thing for his relief.

Tetanus does not require venesection. The blood drawn is always of a looser texture; and bleeding has been usually found hurtful. There are, however, exceptions to this general rule, for the malady sometimes originates from causes, which require a strenu-

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ous antiphlogiſtic treatment. Burſerius records, that tetanus proceeding from an inflammation of the ſtomach was happily removed by repeated bleedings*; and Dr. John Innes cured the hydrophobia ſucceeding to a gaſtritis by copious veneſections, ſo that a hundred and ſixteen ounces of blood were taken from the patient in the courſe of ſeven days†. Likewiſe in order to prevent tetanus from a punctured wound, in young, vigorous, plethoric perſons, eſpecially if febrile ſymptoms be preſent, the antiphlogiſtic treatment ſhould be purſued.

With regard to the manner of dying in this diſeaſe; the patients are deſtroyed by the extinction of the vital principle, occaſioned by the violent repeated ſhocks the conſtitution undergoes in conſequence of the continual efforts nature is making to get rid of the morbid ſtimulus. Hence, if a recovery take place, the convaleſcent remain weak and feeble for ſome time; and bitters, bark, wine, and a nouriſhing diet, are requiſite to reſtore the general habit to it's due tone.

I ſilently paſs over the hydrophobia primaria, and the catalepſy; ſince theſe complaints differ from tetanus only in degree, and require nearly the ſame treatment. The catalepſy, however, being of the chronic kind of nervous diſeaſes, does not ſtand in need of ſuch an active practice, to diminiſh the morbid irritability of the nervous ſyſtem, but is to be remedied by the removal of it's cauſe.

* L. 1. vol. iii, § 277.

† *Med. Eſſays and Obſ.* vol. i, art. 29, p. 227.

GENUS

GENUS II.

Clonic Nervous Diſeaſes.

SPECIES I.

Epilepſy.

The epilepſy is an abolition both of the external and internal ſenſes, attended with violent convulſive motions of the whole body.

The diſeaſe is of a chronic nature, and often laſts for many years without proving fatal. It comes by fits, which often attack perſons ſeemingly in perfect health, and return periodically, though not always at regular intervals.

The paroxyſm is frequently preceded by various ſymptoms, ſuch as laſſitude, ſtupor, head-ache, vertigo, tinnitus aurium, frightful dreams, palpitation of the heart, a fluſhed or pale countenance, and the voiding of a large quantity of pale urine. Often, however, a ſhort vertigo is the only ſymptom that precedes the fit: and ſometimes the attack comes on ſuddenly without any warning.

On the coming of the paroxyſm the patient ſuddenly loſes all ſenſe and power of motion, and falls immediately to the ground. He is agitated with violent convulſions, moving the limbs and trunk of

of the body in various directions; a contortion of the eyes and countenance, and contraction of the fingers, are obſerved; a frothy moiſture iſſues from the mouth; the tongue is often affected and thruſt out of the mouth, and as the affected muſcles of the lower jaw ſhut the teeth with violence at the ſame time, the tongue is often ſeverely wounded; the ſemen, urine, and fæces are ſometimes diſcharged involuntarily; the pulſe and reſpiration are hurried and irregular; the convulſions have ſome momentary remiſſions, but are ſuddenly renewed with their former violence; after a time they ceaſe altogether, and are generally ſucceeded by a ſtate of inſenſibility, and appearance of a profound ſleep. On the remiſſion of the ſymptoms, the patient recovers gradually his ſenſes and power of motion; but there uſually for ſome time remain behind head-ache, laſſitude, and torpor of the whole body.

The remote cauſes of epilepſy may be conſidered as prediſponent, or exciting.

The prediſpoſition conſiſts in an irritability and mobility of the brain and nerves, owing to an original conformation of the ſolids, in conſequence of which ſuch perſons are violently afflicted by ſtimuli, that have little or no effect on others. This prediſpoſition to nervous diſeaſes is ſometimes hereditary. Since a tender and irritable complexion diſpoſes to nervous diſorders, it may readily be underſtood, why men of an irritable fibre, delicate females, and children, labour under nervous diſeaſes more than other perſons; and why, *ceteris paribus*,

ribus, thoſe of a ſanguine temperament are more inclined to theſe diſeaſes than others; becauſe the character of every ſtimulus is eaſily impreſſed on their irritable ſolids.

The occaſional cauſes operate in two ways. They either excite irregular and immoderate motions by irritating the brain and nerves, and thus bring on indirect debility; or they diſturb the energy of the nervous ſyſtem by weakening the whole body. From either of theſe cauſes, the vital powers, endeavouring to reſtore the diſturbed equilibrium, run into irregular and convulſive motions. External injuries of the head, extuberances of the bones, oſſifications, and various tumours within the cavity of the ſkull, tranſlation of a diſeaſe, ſuppreſſed evacuations, repelled cutaneous eruptions, plethora, and the exciting paſſions of the mind, belong to the former. Sordes of the *primæ viæ*, worms, a morbid ſtate either of the womb, or of the abdominal viſcera, eſpecially of the liver and ſpleen, copious hemorrhages, fear, horrour, intenſe ſtudy, frequent intoxication, and narcotic poiſons, are the chief among the latter. For the reſt, the moſt robuſt perſon may contract ſuch a prediſpoſition to convulſive diſorders on various occaſions; while the prediſpoſed to nervous diſeaſes in many caſes remain free from them during their whole lives, by adhering to a proper diet and manner of living. Laſtly, it is to be remarked, that the prediſpoſing cauſes of the clonic nervous diſeaſes ſometimes operate as exciting cauſes; and that, on the contrary, the prediſpotion itſelf to the

epilepſy

epilepsy is often brought on by the occasional causes.

But, though the remote causes of the epilepsy are extremely different from each other, the proximate cause of this disease is always the same, consisting in a determinate degree of disturbance of the functions of the nervous system, seemingly owing to it's direct or indirect debility combined with a morbid irritability. For all the occasional causes, though in other respects quite different, agree in this, that they operate by inducing the system into an apparent or real debility; and thus, by disturbing the functions of the brain and nerves, throw the body into violent convulsive motions. No doubt a determinate degree of disturbance of the brain is requisite to the epilepsy: this degree, however, cannot possibly be determined; for it differs according to the difference of constitutions, and of circumstances; so that the same degree of excitement or collapse will bring on in one an epilepsy, in another St. Vitus's dance, and in a third no disorder at all. But though we are ignorant as to the degree of disturbance of the nervous system, requisite to produce an epilepsy, yet an accurate knowledge of it's predisposing and exciting causes is sufficient to lay down general rules with respect to the prognosis and treatment of the disease, to which I now proceed.

The epilepsy is, in general, difficult to be removed, and often bids defiance to all remedies. Attention should be paid to the following circumstances in it's prognosis.

1, It's different ſpecies. For the idiopathic is much more obſtinate than the ſympathetic, and is often incurable: namely, when the diſeaſe derives it's origin either from different extuberances of the bones of the ſkull, from various tumours, or from any organic defect of the brain. Hence the ancients were accuſtomed to ſay, that the epilepſy is eaſily cured, when ariſing either from the hands or the feet; that the cure proves difficult, if the diſeaſe begin from the head; that if tinnitus aurium, vertigo, and a ſenſatio formicationis in the affected part, precede the paroxyſm, hope of recovery yet remains; but that, when the epilepſy attacks without the leaſt previous warning, it is almoſt always incurable *.

2, The cauſe of the diſeaſe. Thus for inſtance, an epilepſy ariſing from anaſarca uſually deſtroys the patient, becauſe it is attended with great debility of the body, to which for the moſt part a watery collection in the ſkull itſelf is added. The epilepſy, which ſucceeds either to phrenſy, or madneſs, is ſeldom to be cured; as it appears from the diſſections of ſuch bodies, that this diſeaſe is almoſt always produced by ſome fault in the organical ſtructure of the brain †: whereas the epilepſy, which originates from a morbid ſtate either of the ſtomach, or ſome other of the abdominal viſcera, is often readily cured; and the epilepſy occaſioned by dentition is the eaſieſt remedied of all.

* Van Swieten, l. l. vol. iii, § 1058, p. 433.

† Burſerius, l. l. t. iii, cap. viii, § 270.

3, The

3, The age. As the epilepſy is difficult to be removed in perſons of an advanced age; and when it attacks new born children, it moſtly proves mortal. But it is by no means rare for the epilepſy of youth to vaniſh ſpontaneouſly at the age of puberty: which has been obſerved even by Hippocrates: for he ſays, that "They, who are attacked "with the epilepſy before the period of puberty, "are cured by the change of the body itſelf; but "the diſeaſe moſtly accompanies till death thoſe, "who are afflicted with it after the age of twenty-"five *." Though it is to be remarked, that this aſſertion of Hippocrates, reſpecting the ſpontaneous removal of the epilepſy at the time of puberty, is only true, either when, the material cauſe being removed, the convulſive diſpoſition ſtill remains impreſſed on the nervous ſyſtem from habit alone, or when the material cauſe is of ſuch a nature, that it may be removed by the change itſelf, which the conſtitution undergoes at that time. For this reaſon Dr. Quarin is of opinion, that the aſſertion of Hippocrates chiefly holds good with regard to the plethoric †; at leaſt the diſeaſe is far from always diſappearing at the age of puberty; and when the diſorder is not remedied at that period, it moſtly proves incurable.

4, The ſymptoms of the diſeaſe. The more violent and frequent the paroxyſms of the epilepſy, the leſs eaſily is it removeable: becauſe then there is not ſufficient time to remove the morbid cauſe

* *Aphoriſ.* ſect. v, aph. vii.

† L. l. cap. i, p. 20.

during the intermiſſion, and a fatal apoplexy not unfrequently ſucceeds to a violent epileptic fit. If, therefore, the patient do not come to himſelf within a few hours; if after the paroxyſm the ſight be loſt for ſome time; if the ſemen, urine, and fæces, be diſcharged involuntarily in the paroxyſm; and eſpecially if the convulſions return at intervals; theſe are bad ſymptoms.

5, The duration of the complaint. For a recent epilepſy, though frequently returning, is much more eaſily cured, than an inveterate one. Hence the father of phyſic notes, that the epilepſy is no longer curable, when inveterate *. And this is not to be wondered at, becauſe the ſympathetic epilepſy is not only changed into an idiopathic one by the hand of time, ſo that a convulſive diſpoſition is communicated to the nervous ſyſtem by the frequently repeated convulſions; but beſides, the idiopathy, when long continued, is afterwards for the moſt part not to be removed becauſe the diſeaſe is then kept up by an alteration in the organic ſtructure of the ſenſorium, brought on by the repeated fits, from which ſource alſo is to be explained, why thoſe, who have laboured for a long time under the epilepſy or other convulſive fits, often become fooliſh, and acquire an idiotic countenance.

The indications of cure in the epilepſy are twofold. In the paroxyſm, the violence of the convulſive motions is to be moderated. This is done by bleeding from the jugular vein, or from the temporal artery, provided there be ſymptoms in-

* *De Morbo ſacro*, vol. xiii, p. 15.

dicating

dicating local congeſtion in the head; by applying bliſters to the lower extremities, in order to relieve the head; by anodyne and antiſpaſmodic glyſters of opium, valerian, and aſafœtida; by ſtimulating the noſe with volatile remedies, and by rubbing liniments of the ſame kind along the ſpine; and by preventing the tongue from being hurt by inſerting a piece of wood between the jaws. In the intermiſſion between the paroxyſm, the cauſe of the diſeaſe is to be removed, and the morbid irritability of the nervous ſyſtem is to be checked.

After an accurate inquiry into the cauſes of the diſeaſe, the firſt indication is anſwered by various remedies, ſuited to the different exciting cauſes. Thus, if the diſeaſe originate from the aura epileptica, or a ſenſatio formicationis moving from ſome part of the body upwards to the head, we ſhould attempt to remedy the morbid ſtate of the part by bliſtering or by making an iſſue upon it; and if the ſenſation follow the courſe of ſome nerve, this ſhould be divided, and thus the communication of the part affected with the ſenſorium commune deſtroyed. If the epilepſy be produced by paſſions of the mind, and the body be ſeemingly healthy, opium, and the extracts of belladonna and hyoſciamus, are to be adminiſtered. If ſuppreſſed evacuations occaſion the diſeaſe, theſe are to be reſtored. If the malady be brought on by repelled cutaneous eruptions, as is not unfrequently the caſe, antimonials, the woody nightſhade, warm baths, bliſters, &c., are efficacious; and ſetons in the neighbourhood of the head are found to be of the utmoſt utility. This cauſe is always to be attended to in children attacked by the epilepſy; eſpecially, if the attack

begin with a ſenſatio formicationis and a ſhort giddineſs; becauſe children are often attacked with an epilepſy, occaſioned by the ſerous defluxions on the head being imprudently dried up. I once obſerved an epilepſy accompanied by the above ſymptoms, which aroſe from a repelled ſcald head; and ſeveral inſtances are recorded by Quarin *. If the epilepſy ariſe from irritation of the *primæ viæ*, emetics and purgatives effect a cure; and, by the way, the clearing of the alimentary canal ſhould in all caſes be our firſt ſtep toward the cure of the diſeaſe. If it be owing to plethora, a copious bleeding, an antiphlogiſtic regimen, mild purgatives, and a low and abſtemious diet, prove beneficial. If varicous diſorders of the abdominal viſcera (obſtructions) conſtitute the cauſe of the epilepſy, aperients, eſpecially of the hot ſtimulating kind, are to be adminiſtered, the uſe of which is duly to be perſiſted in, as they are likewiſe nervous remedies. The commonly called obſtructions of the glands require thoſe medicines, which I mentioned when treating of the ſcrofula. If the epilepſy be brought on by the debility, and relaxation of the ſolids, as is very frequently the caſe; the bark, preparations of iron, cold bathing, frictions, and moderate exerciſe accompliſh a cure. Cold bathing particularly is of the greateſt uſe in the cure of nervous diſeaſes; and from what I have ſeen, I am perfectly ſatisfied, that it has a conſiderable ſhare in remedying theſe complaints. The epilepſy returning at fixed and determinate intervals often yields to the bark with the wild valerian. If this diſeaſe be produced by a hyſteric affection, recourſe ought to be had to the ferulaceous gums, eſpecially aſa-

* L. l. p. 19.

fœtida,

fœtida, and the other antihysterics. Lastly, anthelmintics perform the cure, in the epilepsy arising from worms. The cause of the epilepsy is however sometimes not to be discovered; and this disorder is not unfrequently kept up by such causes as brave all remedies.

If, though the material cause of the epilepsy be removed, the disease should still continue, on account of a convulsive disposition impressed on the brain and nerves; and thus the complaint should become merely habitual: or if no material cause be discoverable, as is the case in the idiopathic epilepsy: the physician is to attempt to remove this convulsive disposition of the nervous system, by diminishing the morbid irritability of the brain and nerves; which may be done in two ways.

1, By medicines checking the too great irritability of the nervous system by their antispasmodic, and sedative power. Opium, hemlock, deadly nightshade, black henbane, mercury, and factitious cinnabar, belong to these; Morgagni, Greding, Stoll, Cullen, Burserius, Murray, Gmelin, Donald Monro, and A. Monro, having proved by many instances the efficacy of those medicines in the habitual epilepsy *.

* Morgagni, l. l. art. vi, & vii: Ludwig, *Adverſ. med. pract.* vol. i, pt. iv, p. 637, & seq.: Stoll, l. l. pt. 3, sect. v, p. 278: Cullen, l. l. § 1338 and 1342: Burserius, l. l. vol. 3, cap. viii, § 284 & 286: Murray, l l. vol. i, ord. vi, p. 243 & 244: Gmelin, *Apparat. Med.* pt. ii, vol. ii, p. 53, & seq.: Donald Monro, *Essays and Obs. Phys. and Liter.* vol. 3, art. 30; and A. Monro, ibid. art. 31.

It will ſeem paradoxical, perhaps, for me to claſs mercury among the remedies acting by an antiſpaſmodic and ſedative virtue, ſince this remedy is in general looked upon as one of the moſt powerful ſtimulants we poſſeſs; and it doubtleſs quickens the circulation, and gives the blood a buffy coat; but it ought to be remarked, that the ſame effects are obſerved from opium; that all ſedative remedies, previous to their lowering the ſyſtem, operate as ſtimulants; and that the difference between them and the true ſtimulants is, that the torpor ſucceeding to their operation is always much greater than the excitement before occaſioned by them, a circumſtance which generally follows the uſe of the mercurial preparations, and which, as is well known, never takes place after uſing tonics or the high diffuſible ſtimuli.

2, By medicines, which remove the convulſive diſpoſition by inducing the nerves into other motions. Emetic tartar, ipecacuanha, vitriolum album, flores zinci, cuprum ammoniatum, and argentum nitratum, are of this order. Theſe medicines, though greatly differing from each other, agree nevertheleſs in this, that they remove the habitual epilepſy by inducing the nervous ſyſtem into other motions. Theſe do not prove beneficial in every epilepſy, but only remedy it, when it's material cauſe is previouſly removed; or when it is of ſuch a nature, that it may be removed by the powers, which belong in particular to each of theſe medicines. Thus, if only the removal of a habitual epilepſy be required; that is, if the ſole purpoſe be to take away the too great irritability of the

the nervous ſyſtem; it is not always neceſſary to have recourſe to the flores zinci, vitriolum album, cuprum ammoniatum, or argentum nitratum; for it is proved, that the emetic tartar, and ipecacuanha, are able to vanquiſh the diſeaſe, by communicating to the nerves the wiſhed for alteration *.

But though nothing proves more efficacious to prevent the paroxyſm from coming on than an emetic, given a ſhort time, as an hour or two, before; yet it is to be obſerved, that vomits are not capable of freeing the ſyſtem from the habit of running into irregular motions, except in caſes, in which the epilepſy either obſerves fixed and regular periods, or in which the diſeaſe attacks every day, or in which the torpor of the ſenſes, frightful dreams, pain in the head, giddineſs, ſenſatio formicationis in the affected parts, &c., foretel the approach of the paroxyſm. For in caſes, in which the epilepſy returns every week, fortnight, three weeks, or a month, &c., but does not obſerve a fixed day, no utility, I have found, is to be derived from the uſe of emetics, and they ſeem rather to do harm than good. Likewiſe in all caſes in which the patients appear to be weak, emetics are not to be adminiſtered; for there, inſtead of being productive of any benefit, they render the diſeaſe more obſtinate, and do a great deal of miſchief, by farther weakening the ſyſtem.

If it be aſked, how the habitual epilepſy is to be removed by quite different medicines, which muſt

* Richter, *Mediciniſche und Chirurgiſche Bemerkungen*, cap. viii, ſeite 130 zu 136.

of

of courſe neceſſarily affect the nervous ſyſtem in very different ways. I anſwer, that a double faculty is common to all the emetics, for, taken in a ſmall doſe, they all operate as powerful antiſpaſmodics; whereas, when taken in a greater doſe, they ſhock the whole body by exciting vomiting, and communicate new and unuſual motions to the nervous ſyſtem. From which double power it is eaſily to be accounted for, why ſuch medicines, though operating in a different manner, all poſſeſs an antepileptic virtue, under certain circumſtances.

As nevertheleſs the flores zinci, vitriolum album, cuprum ammoniatum, and argentum nitratum, not only poſſeſs the ſame qualities as the others in a greater degree, but, by their peculiar powers, are able to vanquiſh the epilepſy in many caſes, where a material cauſe ſtill exiſts; it is evident, that theſe medicines often produce ſalutary effects, where the emetic tartar, or ipecacuanha, would not afford the leaſt help. If therefore the habitual epilepſy either be joined with acidity of the *primæ viæ*, or even derive it's origin from this ſource, nothing proves more uſeful than the flores zinci, on account of their antacid quality. In a word, in all caſes in which the epilepſy had ariſen from a morbid condition of the *primæ viæ*, I have ſeen the utmoſt ſucceſs from the flores zinci, given from gr. iii to ℈ ß, three or four times a day, for they prove a very powerful tonic in ſtrengthening the alimentary canal. If the debility of the body either be united with the too great irritability of the nervous ſyſtem, or ariſe from this ſource, the vitriolum album proves beneficial by it's aſtringent and tonic powers; from which, both in the epilepſy and

other

other convulsive complaints, I have often seen very good effects. If, in fine, the morbid irritability of the nervous system be so great, that, though the material cause be removed, the convulsive disposition impressed on the nerves is not to be abolished by the above remedies; if this morbid irritability be united with great debility and relaxation of the body; or if the convulsive motions be owing to the debility and relaxation of the system; the physician should have recourse to the cuprum ammoniatum, which exceeds all the other medicines in these cases, and not unfrequently performs a cure after the other medicines have been tried in vain *. If, however, the too great irritability of the nervous system be either united with plethora, or produced by a plethoric habit, the cuprum ammoniatum is not to be given, until the plethora is removed by bleedings; which, if too copious, are not unfrequently succeeded by relaxation and debility, and thus a state is produced, in which the cuprum ammoniatum, noxious in the commencement of the disease, proves beneficial. Of this the celebrated Dr. Thuessink has given us a memorable instance †. I must farther observe, that, when the habitual or idiopathic epilepsy takes place in persons of a tender and delicate constitution, and of a tense fibre, in whom a debility of the system, but by no means weakness and relaxation, takes place, I have experienced the cuprum

* Gmelin, l. l. vol. i, sect. ii, p. 137 & 138: and *Het Zeeuwsch Genootschap der Weetenschappen*, vol. xiv, from p. 363 to 396, containing an excellent dissertation of Dr. Thuessink on the use of the cuprum ammoniatum in nervous diseases, in which what I say on this subject is clearly proved.

† L. l. p. 390.

ammo-

ammoniatum not merely to be uſeleſs, but on the contrary to bring on more frequent and violent paroxyſms; for the methodus operandi of this remedy is too ſtrong for ſuch irritable conſtitutions. In theſe caſes I have found conſiderable benefit from the bark and valerian given in conjunction with the vitriolum album. In fine, with reſpect to the argentum nitratum, I have never tried this remedy myſelf, but I have ſeen it given three times in Guy's Hoſpital, by Dr. Babington, in the St. Vitus's dance. In theſe caſes the diſeaſe was removed in a ſhort time. It has been likewiſe exhibited by other phyſicians in the epilepſy with ſucceſs. It ſeems to act upon the ſame principle as the others: given in a ſmall doſe, it proves a powerful antiſpaſmodic; in a larger one, it occaſions uneaſineſs of the ſtomach, retching and vomiting: as to it's tonic power, it ſeems not to be inferiour to any of the remedies here mentioned.

I have not noticed the viſcus quercinus, the dittany of Crete, pulvis de gutteta Riverii, muſk, caſtor, camphor, ammonia, and the leaves of the Seville-orange: for whatever has been ſaid with reſpect to the antepileptic virtue of theſe medicines by ſome authors, upon trial it will be found, that the viſcus quercinus, dittany of Crete, and pulvis gutteta Riverii, are but of very ſmall efficacy in nervous diſeaſes; and that the others, though powerful in removing inordinate motions of the nervous ſyſtem ſlighter in their degree than the epilepſy, are found much leſs efficacious antepileptics than the remedies, which I have taken the liberty to recommend. The flores cardamines, given from half a

drachm

drachm to a drachm three times a day, have been lately recommended; but as I never saw them tried, and do not find any mention of the particular circumstances, under which they have been useful, I cannot take any farther notice of them.

The operation of the medicines recommended may be very much assisted in many cases by procuring a discharge from the neighbourhood of the head by means of perpetual blisters, issues or setons; which have been very frequently found extremely useful in this disease.

Lastly, in cases of habitual epilepsy, a considerable change of climate, diet, and way of life, has sometimes effected a cure, where all other remedies had failed.

After all that has been said on the subject, we must acknowledge, that we are not yet acquainted with any practice, that proves a certain or even a general cure for the idiopathic epilepsy, and that it sometimes baffles the most skilful treatment.

When life is extinguished by the epilepsy it happens chiefly in the two following ways.

1, The vital principle is, as it were, abolished at a single shock by the violence of the convulsions, and then the patient expires in the paroxysm; which, however, but seldom happens.

2, The patient, having already had many paroxysms, falls at length into a more violent one, which ends

ends in a mortal apoplexy. This termination of the diſeaſe is much more frequent than the former.

With reſpect to the other nervous diſeaſes of the convulſive kind, the compaſs of this treatiſe does not permit me to take particular notice of each; and the leſs, as, though very frequently obſtinate, they ſeldom prove mortal. I ſhall therefore confine myſelf to giving a general view of them, and laying down ſome general rules, which are to be obſerved in the cure of all convulſive diſeaſes.

The nature of convulſive diſeaſes conſiſts in irregular and convulſive motions, brought on in conſequence of the diſturbance of the nervous ſyſtem by ſome morbid ſtimulus. Theſe convulſive motions have received different names according to the degree of their violence: for they differ only in degree, and the greateſt analogy exiſts among them all with reſpect to their cauſes, prognoſis, and treatment: ſo that what I have proved of the epilepſy holds likewiſe good with regard to all convulſive diſeaſes. The other nervous diſeaſes, however, being inferiour to epilepſy in violence, are alſo leſs unfavourable in their prognoſis; and the cure of them is not quite ſo difficult, being frequently accompliſhed by remedies inſufficient to cure the epilepſy.

In the cure of nervous diſeaſes the following general rules are always to be obſerved.

1, The phyſician ought to inquire whether the diſeaſe be ſympathetic or idiopathic. The convulſive nervous diſeaſes are, at leaſt in their commencement,

mencement, very frequently ſympathetic. Their chief ſources are a morbid ſtate of the *primæ viæ*, of the abdominal viſcera, eſpecially of the hepatic ſyſtem, or of the abſorbent veſſels. To the ſtate of theſe organs, therefore, nice attention ought to be paid in all nervous diſorders. The diſtinction between ſympathetic and idiopathic nervous diſeaſes is of the utmoſt importance to the practitioner; for in the latter caſe the cauſe of the diſeaſe originates from a general affection of the nervous ſyſtem, whereas in the firſt the origin of the diſorder is to be looked for in the morbid ſtate of ſome other organ, by which the brain becomes ſympathetically affected; and the irregular actions of the nervous ſyſtem cannot of courſe be remedied but by the removal of the morbid ſtate of that organ, with which the brain ſympathizes.

2, In all nervous diſeaſes great care ſhould be taken to clear the *primæ viæ*, and to keep off all irritation from them; for in the ſympathetic nervous diſorders the diſeaſe frequently originates from irritation of the *primæ viæ*, and is remedied by expelling the morbid ſtimulus: and even in the idiopathic nervous diſeaſes, the alimentary canal for the moſt part ſympathizes with the brain, and ſordes are often collected in conſequence of the morbid action of the nervous ſyſtem. It is of the greateſt moment, therefore, in the treatment of theſe diſeaſes, to pay due attention to the ſtate of the ſtomach and bowels, and to keep the *primæ viæ* clean, by exhibiting from time to time calomel and other purgatives.

3, As

3, As in the cure of all chronic diſeaſes patience is to be recommended both to the perſon who labours under them and to the practitioner, ſo it is eſpecially requiſite in thoſe of the nervous kind; for, though the patients may frequently be very much relieved in the courſe of a few days, yet perſeverance in the uſe of nervous remedies is neceſſary to get completely rid of the complaint; ſince, if the patient leave off the uſe of them on the abating of the ſymptoms, the diſeaſe ſhortly returns with it's former violence. The nervous remedies ought of courſe duly to be perſiſted in for a long time, in order to effect a radical cure of the diſeaſe. In exhibiting them the phyſician ought, at leaſt in irritable delicate conſtitutions, always to begin with ſmall doſes: for if this precaution be neglected, and large doſes be exhibited at firſt to ſuch patients, it frequently happens, that, by carrying the excitement too far, inſtead of removing the complaint, the ſyſtem is thrown into violent convulſive motions by the very uſe of the nervous remedies.

With reſpect to nervous medicines, the limits I have propoſed to myſelf in this treatiſe do not allow of an inquiry into which are the chief among them, and what the circumſtances under which each of them is to be uſed. I cannot, however, forbear to mention, that, in the hyſterical diſorder without an apparent cauſe, and in other convulſive diſeaſes, I have obſerved the utmoſt benefit from aſafœtida; and that ſometimes muſk, caſtor, camphor, and other nervous remedies, having been adminiſtered in vain, the aſafœtida, when it's uſe

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was duly perſiſted in for a ſufficient length of time, has either radically cured, or greatly relieved, the patient.

4, Although it is a fact, that the nervous diſeaſes may now and then require bleeding and the antiphlogiſtic plan, yet it is not to be denied, that, for one caſe, where bleeding affords relief, there are at leaſt twenty in which veneſection would greatly injure the patient. Indeed in nervous diſeaſes, as in almoſt all others, the antiphlogiſtic treatment has been carried a great deal too far; for in almoſt all caſes nervous diſorders are attended with debility in a greater or leſs degree. Hence, both in the idiopathic and ſympathetic nervous diſeaſes, though the convulſive diſpoſition has been removed by the removal of it's cauſe, yet, in order to guard the patient againſt a relapſe of the complaint, the ſyſtem is to be ſtrengthened; for if tonics be omitted, the diſorder makes it's appearance again upon the ſlighteſt errour in diet or manner of living. It may therefore ſafely be laid down as a general rule, that, in all caſes, in which the convulſive motions have been removed without the uſe of tonics, recourſe is to be had to them in order to ſecure the patient againſt the return of the complaint.

5, As the confidence the patient has in the ſkill of his phyſician is of great moment in the treatment of all diſeaſes, this is more eſpecially the caſe with regard to nervous diſorders; for it contributes conſiderably to the cure of the complaint, if the patient be perſuaded, that the phyſician has penetrated the true cauſe of the diſeaſe, and that

the remedies he takes will prove ſucceſsful. The paſſions of the mind likewiſe extremely influence the cure of nervous diſorders; ſo that often, when the patient has been already a great deal relieved, he becomes as bad and ſometimes worſe than before by putting himſelf into a violent paſſion. Nay theſe circumſtances are of ſuch weight in the treatment of theſe diſeaſes, that unleſs the phyſician be capable of acquiring the confidence of the patient, and his mind can be kept quiet, the complaint frequently bids defiance to all remedies.

6, Laſtly, the diet has a conſiderable ſhare in the cure of theſe diſeaſes. As we have above ſeen, that the nervous diſeaſes may ariſe from various and even oppoſite cauſes, the natural inference muſt be, that no rules of diet can be recommended, to which there are not now and then exceptions to be made; but, making a due allowance for theſe particular caſes, I am perfectly ſatisfied, that inſtead of ſtarving the patients by a vegetable diet, as has been commonly the faſhion, the food ought to be of the moſt nouriſhing kind, as chicken-broth, ſtrong beef-tea, veal, beef itſelf, provided the ſtomach can digeſt it, along with vegetables abounding moſt in ſaccharine matter, as potatoes, rice, ſago, &c. All debilitating drinks, as tea and coffee, are entirely to be forbidden. For breakfaſt a cup of chocolate may be taken. For the reſt, the common drink ought to be cold water, the plentiful uſe of which I am ſure is of the greateſt moment in nervous diſeaſes, and I have ſeen the moſt ſtriking inſtances of it; but the quantity to be uſed ought to be ſuited to the circumſtances of the caſe, and it

is

is always to be taken at firſt in ſmall doſes, eſpecially in perſons of an irritable conſtitution. A certain quantity of milk may be mixed with it in order to make it more agreeable to the palate.

But, though I recommend a tonic nouriſhing diet, as greatly contributing to the cure of nervous diſeaſes, yet in general I think it moſt adviſable to abſtain from the uſe of wine: for, though wine, being a very powerful cordial, and a highly ſtimulating remedy, is one of the beſt means we poſſeſs in all fevers of the low kind to rouſe the vital principle into action; nevertheleſs in chronic nervous diſeaſes the ſtimulus of wine operates in general too violently upon the ſyſtem, and, far from removing the complaint, a liberal uſe of wine, eſpecially in an early period of life, is frequently the cauſe of theſe diſorders. Indeed the nervous diſorders are much more frequent among drinkers of wine, than among water-drinkers. Therefore, though in ſome caſes it's uſe may be attended with advantage, in general wine, and all ſtrong fermented liquors, ought to be carefully avoided.

It ought alſo to be obſerved, that, though I am an advocate for a diet of a tonic nouriſhing kind in nervous diſorders, yet I am far from recommending the luxuries of the table; for the diet, though chiefly of the animal kind, ought to be ſimple, and all exceſs is carefully to be ſhunned as highly injurious. It needs ſcarcely to be remarked, that in theſe caſes, where the diſeaſe ariſes from tenſion and plethora, an exception takes place, and a vegetable diet, and the whole of the antiphlogiſtic regimen is to be carried into execution.

CLASS XII.

Diseases of the Secretory Organs.

THE diseases of the secretory organs are those, in which the secerning vessels undergo a considerable alteration, either in their action or structure, without an idiopathic pyrexy, neurosis, or cachexy. It is true that some or other of these is frequently met with in the inveterate stages of the diseases of the secretory organs; and sometimes they are all three combined with them: in this case, however, they are not idiopathic, but to be considered as effects of the morbid state of the secretory organs, by the cure of which they are generally removed.

As all diseases of the secretory organs may be reduced to alteration in their action, or in their structure, this class is thence divided into two orders.

ORDER I.

Alteration of the Action of the Secerning Vessels.

GENUS I.

Polysarcia.

Polysarcia is fatness to such a degree, that the functions proper to the body in it's healthy state are

are either not at all, or at leaſt with difficulty performed.

The prediſpoſition to this diſeaſe exiſts in perſons of a lax habit, infants, youth, and the fair ſex. As nevertheleſs experience ſhows, that many ſuch perſons, though they rather provoke than avoid the occaſional cauſes of corpulency by their diet and manner of living, often remain free from the diſeaſe; it is evident, that the above cauſes are not ſufficient to account for polyſarcia; but that a determinate prediſpoſition of the ſolids, owing to their original conformation, is to be admitted as it's chief prediſponent cauſe. In confirmation of this opinion it may be obſerved, that ſometimes the evolution of the body itſelf ſuffices to incite the prediſpoſed ſolids, a remarkable inſtance of which is to be found in the Philoſophical Tranſactions. A man only twenty-nine years of age, ſix feet high, and almoſt ſeven feet in circumference round the belly, was ſo loaded with fat, that when naked he weighed ſix hundred and nine pounds, and did not accompliſh his thirtieth year, though free from any other diſeaſe*. The exciting cauſes are high living, a ſedentary life, neglect of exerciſe, &c.; all which tend to produce the complaint in the prediſpoſed.

The nature of this diſeaſe is commonly believed to conſiſt in a too healthy diſpoſition of the body, by which more nouriſhment is drawn from the food than the body requires. I greatly doubt, however, whether this hypotheſis be founded on the

* Vol. xlviii, p. 188.

obſervation of nature. For many plethoric perſons, who are obliged to have recourſe, from time to time, to an artificial evacuation of the ſuperabundant blood, are rather lean than fat. Beſides, as was obſerved above, this diſeaſe ſometimes ariſes without any fault in diet. Laſtly, this opinion is refuted by the very ſymptoms of polyſarcia; torpor of the vital principle always accompanies it's inveterate ſtage; and all the ſecretions languiſh, and become diminiſhed, that of fat alone excepted. Therefore the nature of this malady ſeems rather to conſiſt in a peculiar prediſpoſition of the organs ſerving to the ſecretion of fat, or, to expreſs myſelf more clearly, to a morbid irritability of theſe organs, by which, being very ſenſible to ſtimuli, they ſecern more than a due quantity of fat in a given ſpace of time. Now, as it is a general law of nature, that the more the organs are exerciſed, and the more vigorous their action is, the more blood is conveyed to them, and this blood again operates as a ſtimulus to the ſecerning veſſels; it muſt neceſſarily follow, that this diſeaſe daily increaſes more and more, ſo that the other parts of the body become at length deprived of the due quantity of blood requiſite to their nouriſhment, and almoſt the whole maſs of blood is, as it were, ſpent in the ſecretion of fat. All the phenomena of the diſeaſe not only agree with this explanation, but it is farther confirmed by diſſection. For the learned Dr. van Geuns relates, from the Miſcellaneæ Naturæ Curioſarum, that a man forty-two years of age, who died ſolely from too great a quantity of fat, " exhibited in a vaſt body extremely thin bones, " and very tender muſcles, rather membranaceous

" than

" than carnous, ſo that all the real fleſh, in the " whole body, at the moſt did not exceed ten " pounds*:" an evident token, that polyſarcia is produced not by a ſuperabundant nutritious matter, but by an immoderate action of the organs ſerving to the ſecretion of fat, defrauding the other parts of their due nouriſhment.

The prognoſis of this diſeaſe is very ominous, ſince ſcarcely any hope of recovery exiſts.

The cure of this diſtemper ſhould however be attempted by uſing a low ſpare vegetable diet, with much bodily exerciſe, and by inhaling at the ſame time the vital air, greatly recommended in this diſeaſe by Dr. Girtanner. In reality, the uſe of the oxygen gas ſeems to be adviſable; as it may naturally be expected, that as a powerful ſtimulus it will rouſe the vital powers to action, and thus both the ſuperabundant ſecretion of fat will be ſtopped, at leaſt in a great meaſure; for ſome degree of languor and debility ſeems to be requiſite to this diſeaſe; and the lymphatics will be incited to the abſorption of the fat already ſecerned. Vinegar, ſoaps, and the mephitic water, are alſo recommended for reducing too great corpulency; but theſe, if really of any uſe in this diſeaſe, do not operate at leaſt by chemically reſolving the fat, as has commonly been thought. All theſe remedies, however, are found in general inſufficient to put a ſtop to the progreſs of the diſeaſe. I would therefore recommend, in conjunction with them, a trial

* *Diſſ. laud.* § ii, in nota.

of the remedies, which we know moſt effectually operate upon the lymphatic ſyſtem; ſuch as the digitalis, mercury, ſquills, &c.; with which tonic and nervous medicines are to be combined, in order to ſupport the conſtitution during their uſe, and to guard againſt the noxious effects, of which the former two in particular are frequently productive. Theſe medicines deſerve the more to be tried, as a remedy, by which the diſeaſe, at leaſt in it's advanced ſtages, has been known to be cured, is not yet diſcovered.

If, as uſually happens, the diſeaſe do not yield to the power of phyſic, the torpor of the vital principle and the languor of all the functions daily increaſe, the corpulent are rendered every day more and more unfit for motion, and at laſt they die, or rather ceaſe to live: for, ſtrictly ſpeaking, they have been in a nearly dying condition for a long time, ſince this morbid quantity of fat operates as a poiſonous ſtimulus upon the body, and leſſens, or even ſuppreſſes the functions. The organs indeed reſiſt the ſtimulus, and endeavour to preſerve life, which in conſequence is ſtill kept up for a long time; however, as both the vigour of the organs, and their reaction to the ſtimulus daily decreaſe, at length their action is totally ſuppreſſed, they yield to the ſtimulus, and death, ſtealing ſlowly on by degrees, gently aboliſhes life. Such an euthanaſy nevertheleſs does not frequently happen to thoſe, who labour under polyſarcia, as the ſuffuſion of fat is ſeldom ſo diſtributed through the whole body, that all the functions equally ſuffer. Hence, if one vital organ be more ſurrounded than

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the others with fat, it's function becomes oppreſſed, to which oppreſſion death always quickly ſucceeds; and for this reaſon the corpulent are moſtly deſtroyed by an apoplexy, a ſuffocation, or ſyncope*.

ORDER II.

Alteration of the Structure of the Secerning Veſſels.

The difference between this order and the former is, that here the ſecerning veſſels always generate a peculiar matter, either wanting in the healthy ſtate, or deviating from it, which appears under a different form, according to the different modification of the ſecretory veſſels.

GENUS I.

Diabetes.

That the rational practice of phyſic ought to be built upon the nature of the diſorder, and that the diſeaſes, the proximate cauſe of which is not yet aſcertained, are the moſt difficult to be remedied, the diabetes affords a ſtriking inſtance. On the proximate cauſe of this diſorder phyſicians do not

* T. Schwencke, *Hæmatologia*, p. 22 & 23: van Geuns, l. l. § ii. in nota: and Macbride, l. l. p. 358.

agree;

agree; conſequently different and even oppoſite manners of treatment have been purſued; all which probably, but under different circumſtances, may be adopted with benefit to the patients. But the misfortune is, that writers on the ſubject have drawn general concluſions from one or two caſes that fell under their care, and ſtrongly recommend in all caſes the remedies they uſed with ſucceſs. As this diſeaſe has been very much the ſubject of medical converſation within a few years, I ſhall particularly inquire into the three opinions at preſent prevailing on the proximate cauſe of the diſorder, and conſider the principles upon which each of them is founded, in order to aſcertain, which of them agrees with the phenomena of the diſeaſe.

The firſt is, that the diabetes is a diſeaſe of the ſyſtem in general, and not a local diſorder of the kidnies; and that it is owing to an imperfect aſſimilation. For as ſome time is requiſite to the converſion of the chyle into blood, and during that time a conſiderable part of the chyle paſſes off by the mammæ of thoſe females who give ſuck; ſo likewiſe, when the powers of ſanguification are from any cauſe weak, and the converſion of the ſaccharine matter the chyle contains is conſequently ſlow and imperfect, it may paſs off by other ſecretions as well as that of the mammæ. Hence they explain the emaciation and debility which always attend the diabetes; for, a conſiderable quantity of chyle paſſing off by the kidnies, the other parts are deprived of their due nouriſhment, and the ſyſtem cannot but become weakened.

This opinion is refuted, by the blood being deſtitute of ſweetneſs in diabetes; an unequivocal ſign, that the ſaccharine matter does not preexiſt in the blood. It is true, Dr. Dobſon* records, that the ſerum of the blood in his patient was ſweetiſh to the taſte; but, as all other writers on the ſubject agree, that the ſerum is never ſweet in diabetic patients, and the learned doctor himſelf obſerves, that the ſerum of the blood was only ſweetiſh, but the urine very ſweet, the truth of this experiment ſeems juſtly to be diſputed; at leaſt the conſiderable quantity of ſugar found in the urine of diabetic patients cannot be accounted for from this ſource.

The argument drawn from the function the mammæ perform by no means favours this opinion; becauſe it is founded upon the falſe principle, that human milk is the chyle itſelf. But daily experience proves, that the quantity of human milk is by no means in proportion to the food taken in. Many women, who ſuckle two children, have no extraordinary appetite, and are nevertheleſs ſtrong and vigorous. The human milk always poſſeſſes the ſame properties, as well when the nurſe has not taken any nouriſhment for ſome hours, as directly after dinner. Women, who labour under jaundice, and in whom thus no proper chyle can be formed, in general have very good milk, ſo that children may ſafely ſuck nurſes labouring under this complaint, as the doctors Graewen and Schrage have frequently experienced†. I have myſelf ſeen

* *Med. Obſerv. and Inq.* vol. v, art. xxvii.

† *Act. ſervand. Civib.* T. xii, p. 13.

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two ladies, who, though afflicted with the jaundice, had very good milk, and ſuckled their children during the whole courſe of the diſeaſe. The ſame is to be ſaid of wet-nurſes labouring under the venereal diſeaſe, who, when they have not had the confirmed lues upon them for a conſiderable length of time, may be permitted to ſuckle children without any injury: though it is to be obſerved, that this holds good only with regard to recent caſes; ſince, in the inveterate ſtages both of the jaundice and lues venerea, as all the ſecretory organs become in time affected by the morbid ſtimulus of the contaminated blood continually acting upon them, the natural conſequence muſt be, that the milk likewiſe undergoes a change from it's healthy ſtate, and can no longer ſerve for properly nouriſhing the child. Laſtly, anatomy proves beyond diſpute, that the human milk, though agreeing with the chyle as to ſome properties, nevertheleſs is by no means a chylous fluid attracted to the mammæ before it is changed into blood; but on the contrary is the effect of a peculiar ſecretion going on in theſe organs, in conſequence of a ſpecific ſtimulus. For in the diſſection of females giving ſuck, the blood-veſſels going to the mammæ are found to be three times bigger than their ordinary ſize; an evident token, that a peculiar fluid is ſecerned by them from the blood. Hence may be readily underſtood, how both in the jaundice and lues venerea, when not inveterate, natural milk may be prepared from the contaminated blood by the ſecerning veſſels of the mammæ.

Beſides,

Beſides, ſuppoſing that human milk really was chyle paſſing off by the mammæ, ſtill the ſaccharine matter could not poſſibly be derived from this ſource; becauſe it is well known, that the urine diſcharged in diabetes commonly equals or exceeds all the food and drink ingeſted; and that much more ſaccharine matter may be obtained from a given quantity of diabetic urine, than from the ſame quantity of milk. To ſhow this ſtill more clearly, the conſideration of the hiſtory of a diabetic patient, who fell under the care of Dr. Dobſon, will be wholly ſufficient. This patient paſſed twenty-eight pints of urine every twenty-four hours. He took, during the ſame ſpace of time, from twelve to fourteen pounds of ſolid and fluid nouriſhment, and the ſame quantity of drink; a large proportion of which, we are informed, was likewiſe of the nutritive kind. The food and drink taken in was thus at the utmoſt barely equal to the urine diſcharged. The drink was only in a large proportion of the nutritive kind: whence we may ſafely ſtate, that the drink of the nutritive kind did not exceed ten pounds, which added to the fourteen pounds of nouriſhment the patient took every day, make twenty-four pounds, and thus four pounds leſs than the urine diſcharged. More than double the quantity of ſaccharine matter may always be extracted from any quantity of diabetic urine, than can be obtained from the ſame quantity of milk, a humour reſembling the moſt of all the chyle as to it's properties. Beſides, no nouriſhment whatever can be wholly changed into a nutritious fluid, of courſe twenty-four pounds of ſolid and fluid nouriſhment cannot afford twenty-four pounds

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of chyle. Therefore admitting the whole of the alimentary matter to be carried to the kidnies, yet even this would not be ſufficient to account for the conſiderable quantity of ſugar to be extracted from the urine of thoſe who labour under the diabetes mellitus. Not to ſpeak of the excrementitious fluids, which every twenty-four hours paſs off by the other emunctories.

But it may perhaps be argued, that, if we be to look upon the chyle and the human milk as two different fluids, the natural inference muſt be, that the proportion of ſugar contained in a given quantity of milk cannot be employed to prove, that the ſugar found in the diabetic urine is not to be derived from the alimentary matter drawn off by the kidnies, but from a peculiar ſecretion of ſweet urine. This objection however will be found of no weight. On conſidering that milk and chyle, though different liquors, yet approach very near each other in many properties: that when I make the calculation, I ſuppoſe, that the whole of the food and drink is converted into chyle, which, as it is well known, is never the caſe: that, in fine, it is equally obvious, that all the food and drink taken together would not probably furniſh more ſaccharine matter than may be had from the ſame quantity of milk, and thus, of courſe, though milk and chyle are different fluids, yet the quantity of ſugar contained in the human milk may ſerve us to compute, at leaſt on an average, the quantity of ſugar to be found in the chyle itſelf.

Laſtly,

Laſtly, that diabetes is not an affection of the ſyſtem in general, but a local complaint of the kidnies, appears from this: that in the inveterate ſtages of diſeaſes attacking the general habit, as ſcrofula, ſcurvy, and the lues venerea, all the ſecretions are vitiated and partake of the morbid diatheſis prevailing in the ſyſtem; but in the diabetes, when not combined with any other diſeaſe, even in it's moſt advanced ſtages, all the ſecretions, that of urine alone excepted, are performed according to the laws of health.

This opinion of the nature of the diſeaſe is thus founded upon a mere hypotheſis, and refuted by the very ſymptoms of the diſeaſe.

As to the ſecond, the opinion of Dr. Rollo, though it has ſome analogy with the previous hypotheſis, as in both theories diabetes is conſidered as a diſeaſe of the ſyſtem in general, yet it differs from the former in this, that, according to the former opinion, the origin of the diſorder is to be imputed to the weakneſs of the powers of ſanguification; whereas Dr. Rollo looks upon the ſtomach as the ſource of the complaint. This phyſician is of opinion, that the diabetes mellitus depends on a hyperoxygenated ſtate of the ſyſtem, occaſioned by a morbid ſtate of the ſtomach, which conſiſts in an exceſſive action, of a morbid kind, of the muſcular fibres of the ſtomach; with the ſecretion of too great a quantity of the gaſtric fluid, and ſome alteration in it's quality, producing with ſubſtances capable of forming it ſaccharine matter; and a certain defect in the powers of aſſimilation, depending

pending alſo in part on too active a ſtate of the lacteal veſſels. Of courſe he holds, that the ſyſtem is to be deoxygenated: and thus the obvious remedies for the cure of this diſorder are thoſe that abſtract oxygen from the ſyſtem. This indication, in his opinion, is to be anſwered by breathing a lowered atmoſphere, by confinement in a ſmall room, abſtinence from exerciſe, rubbing the ſkin with hog's lard, the uſe of a diet of animal food as rancid as it can be eaten, and the internal exhibition of the hepatiſed ammonia and narcotics. To prove this opinion the doctor makes uſe of the following arguments.

1, That a morbid condition of the ſtomach is to be conſidered as the origin of this diſorder, is evident from the keenneſs of appetite, which accompanies diabetes; from the feeling of pain or uneaſineſs in the region of the ſtomach; and from a ſtrong tendency to acidity, always obſerved in this diſtemper.

2, That a hyperoxygenated ſtate of the ſyſtem takes place, is not leſs manifeſt from the benefit brought on by the uſe of remedies abſtracting oxygen. For the formation of the ſaccharine matter may be removed in a ſhort time by making uſe of animal food ſolely; and by avoiding vegetables it will not be again reproduced: while the diſorder is increaſed by the uſe of vegetables, and when removed is brought on again by it.

3, This opinion is farther proved by the powerful effect of remedies, which diminiſh the action

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of the ſyſtem in general, and of the ſtomach in particular, as confinement, veneſection, emetics, hepatiſed ammonia, camphor, and narcotics.

4, The condition of the blood, altered from it's healthy ſtate, is a freſh argument to prove, that diabetes is by no means a local diſorder of the kidnies, but a diſeaſe of the whole ſyſtem. For though the blood taken in any period of the diabetes is not ſenſibly ſweet to the taſte, Dobſon's caſe excepted, yet it's ſerum has a wheyiſh appearance.

5, The decreaſe of the quantity of urine being in proportion to that of the ſaccharine matter, is another argument demonſtrating this opinion: as this phenomenon is to be accounted for from the correſponding diminution of the action of the kidnies, when the action of the ſtomach has been diminiſhed; while, if a change of ſtructure in the kidnies of a nature different from mere enlargement of veſſels took place, the diminution of urine would not have been ſo ſpeedy and determinate.

6, Laſtly, that a hyper-oxydation of the ſyſtem takes place in diabetes, and that it is removed by animal food, ſeems clearly to be demonſtrated by the appearances of the blood in the doctor's firſt patient before and after it's uſe. The patient being bled previous to the diet of animal food, the ſerum of the blood had the appearance of whey, and the craſſamentum had a buffy coat of a bluiſh colour, ſimilar to what mercury ſometimes produces. Whereas, after having made uſe of animal food

ſolely for a long time, the blood was covered with a very thin pellicle of coagulable lymph of a looſe texture reſembling the white of an egg, except which there was no other ſeparation of parts exhibited. The phenomena obſerved after the two bleedings were not leſs different: for after the firſt the patient became lighter, and more cheerful; whereas after the ſecond he felt himſelf heavy and languid. Hence the doctor concluded, that an oppoſite ſtate of the ſyſtem had been produced, or that by the uſe of animal food the ſyſtem had paſſed from a hyperoxydated to a deoxydated ſtate, approaching to that of ſcurvy, into which diſeaſe diabetes may thus probably be changed, by continuing to live only upon animal food *.

With the utmoſt deference to the abilities of this phyſician, I am very much diſpoſed to doubt, whether theſe arguments really prove what the doctor would deduce from them. The contrary, in my humble opinion, will readily appear, upon a more minute inquiry into each.

As to the firſt. That keenneſs of appetite generally accompanies diabetes is beyond diſpute: however, the inference, that the ſtomach is the ſeat of the complaint, cannot thence be drawn. For, if it were ſo, the keenneſs of appetite ſhould be a characteriſtic mark of diabetes; whereas experience teaches, that in the jaundice, and in many other diſeaſes, a voracioufneſs often takes place without diabetes; and on the contrary this diſeaſe

* See Rollo, l. l. vol. i, p. 48 and 266.

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is ſometimes met with even with a loſs of appetite, as in the caſe mentioned by Dr. Dickſon of a diabetic patient, whoſe appetite was quite gone *. The patient who fell under the care of the late Dr. Ooſterdyk alſo had no appetite †. The appetite is much ſtronger in ſome patients than in others; without any correſponding influence of the diſeaſe. Dr. Richter does not mention the increaſed appetite among the ſymptoms of his diabetic patients; he only obſerves, that they generally had a good ſtomach. Dr. Frank ſeems alſo to have met with no extraordinary appetite in his patients labouring under diabetes. Even the caſes recorded by Dr. Rollo prove, that in diabetes the appetite may be more or leſs keen, without any correſponding diminution of the diſorder: for he mentions one caſe, in which the appetite was very keen, at the ſame time, that the thirſt and the other ſymptoms were very much abated, and the quantity of urine was reduced from ſeventeen pints to two pounds ten ounces ‡. It appears alſo from another caſe, related by the ſame author, that the appetite may be leſs vigorous, or even quite gone, notwithſtanding the diſorder is getting worſe, inſtead of being diminiſhed §. Hence it is evident, that the keenneſs of appetite is not a characteriſtic mark of diabetes.

With reſpect to the feeling of pain, or of an uneaſy ſenſation in the region of the ſtomach, and

* *Med. Obſ. and Inq.* vol. 3, art. xv, p. 140.

† *Hollandſche Maatſchappy der Weetenſchappen, 12 deel berigten*, p. 30.

‡ L. l. vol. ii, p. 88. § L. l. vol. ii, p. 101.

a ſtrong tendency to acidity, ſymptoms with which the diſorder is often attended; theſe likewiſe do not conſtitute characteriſtic ſigns of diabetes: for in ſome caſes only one of them, or even neither, is preſent *. Dr. Rollo, in his ſecond volume, mentions different caſes, in which theſe ſymptoms did not appear: which ſhows, that, though frequently accompanying diabetes, they do not belong to it's nature. This is farther proved by perſons, who, though labouring under an uneaſy ſenſation in the region of the ſtomach, and the utmoſt acidity of the *primæ viæ*, ſtill ſhow not the leaſt ſign of diabetes. It is well known, that ſometimes a diſeaſed ſtate of the ſecretory veſſels of the ſtomach takes place, of which a morbid ſecretion of the gaſtric juice is the conſequence. The patients have in theſe caſes as it were, "a brewery of "vinegar in the ſtomach;" and, though living upon animal food ſolely, they only experience a ſhort relief or mitigation of the diſorder. This morbid ſtate of the ſtomach is likewiſe often attended with voraciouſneſs. But though here all the ſymptoms are preſent, from which Dr. Rollo concludes, that the ſeat of diabetes is in the ſtomach, the ſecretion of urine goes on in the ſame manner, as in the healthy ſtate; which clearly proves, that the ſeat of the complaint in the diabetes is not the ſtomach, but that the action of this organ is altered in diabetes by ſympathy, and in conſequence of the morbid ſtate of the kidnies. It is worth while farther to obſerve, that, according to the obſervations of Dr. Richter, pills compoſed

* Richter and Frank, l. l.

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of equal parts of aſafœtida and the gall of an ox, are to be conſidered as a ſpecific for the morbid ſtate of the ſtomach juſt mentioned *. I have pretty often had an opportunity of treating ſuch patients, and from my own experience I dare venture to ſay, that the aſafœtida alone anſwers the purpoſe nearly as well, and ſeveral other phyſicians have aſſured me, that they have obſerved the ſame. Now the aſafœtida has been exhibited by Dr. Home in diabetes, but with no happy effect. I ſhall here make uſe of the doctor's own words. "I "gave him a drachm of aſafœtida in the day, but "it took away his appetite, was attended with a "feveriſh ſtate, and was at laſt given up as diſ-"agreeable to him. It ſeemed rather to hurt "him †."

All this leaves no doubt, that the proximate cauſe of diabetes is not to be looked for in the ſtomach; but that the morbid ſtate of this organ is an effect of the diſorder, on account of the ſympathy, which exiſts between the ſtomach and the kidnies: ſince, when the kidnies labour under any diſorder, the action of the ſtomach for the moſt part becomes diſturbed. The voracioufneſs therefore obſerved in diabetes is to be imputed partly to the ſympathy of the ſtomach with the kidnies, and partly to a ſalutiferous effort of nature, by which ſhe attempts to repair the unuſual loſs. Thus, as Dr. Dobſon juſtly obſerves, in the caſes, in which the extraordinary appetite happily keeps pace, at leaſt in ſome meaſure, with the neceſſities

* L. 1. kapitel xv.

† *Chemical Experiments*, 2d edition, p. 319.

of the ſyſtem, the diabetes becomes a chronical complaint; whereas, if the appetite fail, the diſorder, when not ſoon remedied, generally proves a very rapid conſumption.

As to the ſecond. That the formation of ſaccharine matter will be removed by putting a diabetic patient upon animal food ſolely, I have not the leaſt doubt. That the diſorder increaſes by living on vegetables, or rather by making uſe of the uſual diet, and when removed is brought on again by it, is equally certain. Dr. Babington, one of the phyſicians to Guy's Hoſpital, in order to aſcertain the certainty of it, put a diabetic patient, who was a little while ago in Guy's Hoſpital, upon animal food during twenty four hours, and his urine became ſaltiſh; then he gave the patient leave to eat vegetables, and his urine became ſweet again; he repeated this experiment twice, and the event was always the ſame.

Thus it appears, that deſtroying the ſweetneſs of the urine and removing the diſeaſe are two very different things: for this experiment ſhows, that the ſweetneſs of urine may be removed, without removing the diſorder itſelf; as it was evident from the quantity of urine voided, that the diſorder was ſtill going on, though the formation of the ſaccharine matter was ſuſpended by the animal diet. Indeed nobody would venture to ſay, that this patient was free of the diabetes, becauſe his urine was quite ſalt.

The

The caſes related by Dr. Rollo ſerve likewiſe to ſhow, that though to deſtroy the formation of ſaccharine matter, and to render the urine quite ſalt, the living upon animal diet, even for a ſhort time, is ſufficient; yet ſuch a diet only palliates the diſorder, and is never capable of accompliſhing a radical cure. To get completely rid of the diſeaſe, Dr. Rollo himſelf, and other phyſicians have been obliged to make uſe of emetics, laudanum, hepatiſed ammonia, iſſues in the region of the kidneys, camphorated tincture of opium, the cold bath, &c. Indeed not a ſingle caſe is mentioned in which animal food alone has remedied the diſorder. Hence, though the animal diet has been continued during a long time, yet, on returning to the common manner of living, the ſweetneſs of urine is directly reproduced; of which we have a ſtriking inſtance in the ſecond patient of Dr. Rollo. Having lived upon animal food for more than ſix weeks, and his urine being in the mean time of a pungent, ſaline, and bitteriſh taſte, nevertheleſs, upon returning to the common diet, his urine became ſweet again *. Thus the living upon animal food puts a ſtop to the ſecretion of ſaccharine matter, but does not remedy diabetes itſelf; for though ſaccharine matter cannot be drawn from the urine of diabetic patients, after having made uſe of an animal diet during ſome ſpace of time; yet the ſecretion of urine does not go on according to the laws of health; as it appears from chemical inquiries made into the urine of diabetic patients, who lived upon animal food, that the properties of this fluid,

* Rollo, l. l. vol. i, p. 133 and 136.

though different according to various circumſtances, never are perfectly ſuch as are obſerved in the healthy ſtate, and that ſometimes unknown ſalts are met with in the urine, when ſubjected to evaporation *.

The animal diet, however, though it is incapable of radically curing diabetes, and only effects a palliative cure or a temporary relief, is notwithſtanding of the greateſt advantage in diabetes, and the public is very much obliged to Dr. Rollo for his diſcovery; becauſe it is a matter of importance, to prevent the formation of ſaccharine matter, which cannot be carried on without great damage to the conſtitution, and when it is prevented, the phyſician has an opportunity of uſing powerful remedies to accompliſh the radical cure. But by what means does the living upon animal food ſuſpend the formation of ſaccharine matter, and on the contrary the uſing of vegetables reproduce it when removed? If we conſult Dr. Rollo, we are told, that, in diabetes, the ſyſtem, being in a hyperoxygenated ſtate, becomes deoxygenated by the animal diet; whereas vegetables, by furniſhing freſh oxygen to the ſyſtem, keep up the morbid diſpoſition of the ſtomach to produce ſaccharine matter from ſubſtances capable of forming it.

However, if we conſider the conſtituent parts of animal food, and if we a little more minutely inquire into the caſes recorded by Dr. Rollo himſelf, we ſhall find, that this hypotheſis is founded

* Rollo, l. l. vol. i, p. 115 and 118.

upon

upon very feeble grounds. Upon inquiry into the firſt or primary principles both of the animal and vegetable kingdoms, we ſhall find, that all vegetable ſubſtances may by analyſis at laſt be reduced to three firſt principles, namely, hydrogen, carbone, and oxygen, to which we muſt add in a few plants a little azote; and that the animal kingdom has four firſt principles, carbone, hydrogen, oxygen, and azote. The difference between animal and vegetable ſubſtances then conſiſts chiefly in the preſence or abſence of azote; oxygen being preſent in a large quantity both in vegetable and animal ſubſtances. Thus if diabetes depend on a hyperoxygenated ſtate of the ſyſtem, and the diſorder be to be cured by remedies abſtracting oxygen, it is truly ſurpriſing, that this indication can be anſwered by ſubſtances containing a large quantity of oxygen; the leſs, as animal ſubſtances, from which oxygen may be obtained in abundance, are chiefly recommended in the diſeaſe; for blood-puddings, and fat as rancid as it can be eaten, are found very powerful in preventing the formation of ſaccharine matter. Now that blood contains a large quantity of oxygen, no one will queſtion. This is equally certain with reſpect to fat; as this ſubſtance is well known to be compoſed of hydrogen, and carbone combined with a conſiderable proportion of oxygen, which is ſtill increaſed, when it grows rancid. Indeed how the ſyſtem can be deoxygenated by ſuch ſubſtances, is very difficult to be underſtood; on the contrary, if a hyperoxygenated ſtate of the ſyſtem really took place in diabetes, it is to be apprehended that, inſtead of deoxygenating the ſyſtem, the hyperoxygenated ſtate of it would be ſtill farther increaſed

creaſed by the very uſe of the above ſubſtances. Dr. Frank and Dr. Ferriar have cured the diſorder by the uſe of tonics*; and Mr. Scott has twice remedied diabetes by uſing nitrous acid and mercury†. Now it is pretty clear, that theſe remedies, of which the laſt two in particular are ranked among the chief remedies imparting oxygen to the ſyſtem, by the advocates of the pneumatic doctrine themſelves, cannot poſſibly operate in diabetes by abſtracting oxygen from the ſyſtem.

This being ſufficient to ſhow, that the animal diet does not act by abſtracting oxygen from the conſtitution, I now proceed to demonſtrate, that the reproduction of the ſweetneſs of urine by uſing vegetables is equally far from corroborating in the leaſt the doctor's opinion.

To prove this, it will be enough to obſerve, that the ſaccharine matter, which may be had from the urine of diabetic patients, moſtly exceeds very much the quantity of the vegetables uſed, as upon an accurate inquiry would appear from all the caſes recorded by Dr. Rollo, but for brevity ſake I ſhall mention only one. The patient took in twenty-four hours two pounds and half of animal food, with ſome potatoes and bread, and twelve pounds of liquids, including milk, beer, and water. During the ſame ſpace of time his urine amounted to ſeventeen pints, which yielded on evaporation two pounds and half of ſaccharine extract‡. Now ſuppoſing all the vegetable ſubſtances uſed to be

* See Frank, l. l. and Rollo, l. l. vol. ii, p. 203.

† Rollo, l. l. p. 203 and 204.

‡ L. l. vol. ii, p. 75.

com-

completely changed into pure ſugar, it is impoſſible to account for this quantity of ſaccharine matter from that ſource. In two other caſes mentioned by Dr. Rollo, milk, a liquor containing much more ſugar than many vegetables, was allowed to the patient without ſeemingly occaſioning the leaſt detriment*. If however the patient make uſe of a milk diet, the ſweetneſs of urine is reproduced, as I have had an opportunity of obſerving in the diabetic patient, who was ſome weeks ago in Guy's Hoſpital, when ordered by Dr. Babington to live only upon milk during twenty-four hours. But this experiment, far from ſerving to ſupport the hypotheſis of Dr. Rollo, as would ſeem at the firſt appearance, extremely corroborates our opinion, for much more ſaccharine matter may always be extracted from any quantity of diabetic urine, than is contained in the ſame quantity of milk. Thus, though the ſtomach had extracted all the ſugar, which might be had from the milk, yet the ſaccharine matter found in the diabetic urine could not be accounted for from this ſource; and the leſs as the urine of this patient far exceeded the quantity of food and drink taken, was remarkably ſweet, and yielded on evaporation a conſiderable quantity of ſaccharine matter. Not to mention, that, if a diſpoſition of the ſtomach to produce ſaccharine matter from ſubſtances capable of forming it really took place in diabetes, the formation of ſaccharine matter would be ſtill going on, though the patient lived upon animal food: becauſe the carbone, the hydrogen, and the oxygen, ſubſtances of which ſugar is compoſed, are equally met with both in the animal and vegetable kingdoms.

* L. l. vol. i, p. 82; and vol. ii, p. 72.

It

It appears thus, that the hyperoxygenated ſtate of the ſyſtem is not in the leaſt proved by the prevention of the formation of ſaccharine matter by the animal diet, and by the reproduction of it by uſing vegetables.

If it be aſked, how the formation of the ſaccharine matter is prevented by animal food, and reproduced by the uſe of vegetables, I anſwer, that accurate experiments, ſhowing the formation of the ſaccharine matter to be increaſed by a vegetable diet, are hitherto wanting; for, as far as I know, no diabetic patient has ever been put on vegetable diet ſolely; and it has only been aſcertained, that, by having recourſe to the common diet, the ſweetneſs of urine, when removed by animal food, returns again. Suppoſing, however, that it was proved, that the formation of ſugar by the kidnies is increaſed by vegetable diet, it would ſtill be explicable only from a peculiar manner of operating on the kidnies brought on by the ſpecific ſtimulus of a vegetable diet, the conſequence of which is a ſecretion of ſweet urine; becauſe it is demonſtrated above, that the conſiderable quantity of ſaccharine matter found in the diabetic urine cannot poſſibly be drawn from the vegetables themſelves by a morbid action of the ſtomach.

The abſence of the ſaccharine matter during the uſe of animal food is, in my opinion, to be explained in the following manner. By living upon animal food alone a new ſtimulus is communicated to the kidnies, by which theſe organs, being ſpecifically ſtimulated, ſpecifically react; the conſequence of which reaction is, that, inſtead of ſweet urine, they

ſecern

ſecern urine deſtitute of ſweetneſs: but by ceaſing to live upon animal food, before the ſecretion of urine is reduced to the laws of health by proper remedies, the preternaturally affected kidnies, being no more impeded in their action by the ſpecific ſtimulus of animal food, directly ſecern again urine ſweet to the taſte.

This opinion is ſupported by theſe conſiderations; firſt, that the nature of the fluid prepared by the ſecerning veſſels in a great meaſure depends on the different ſtimuli communicated to them: thus, for inſtance, the veſſels, which ſupply the urethra with mucus, being ſpecifically ſtimulated by the venereal poiſon, ſecern a peculiar fluid, capable of propagating the venereal contagion; the veſſels of the ſchneiderian membrane ſecern frequently, inſtead of their uſual ſecretion, a fluid poſſeſſing different properties according to the different ſtimuli applied to the ſecreting ſurface; and the ſame holds good with reſpect to all other ſecretory organs: and, ſecondly, that the ſecretion of urine undergoes various changes in various diſeaſes according to the different ſtimuli communicated to the kidnies.

Animal food ſeems therefore to operate in diabetes by communicating another ſtimulus to the ſecretory veſſels of the kidnies, by which a ſtop is put to the ſecretion of the ſaccharine matter, as long as the ſtimulus of animal food is continued.

As to the third. The good effects, which are obſerved in diabetes from bleeding, emetics, narcotics, camphor, and the hepatiſed ammonia, prove nothing in favour of the doctor's opinion: for bleed-

bleeding by no means brings relief in all cases, but, as I shall have an opportunity of proving below, is useful only on certain occasions; and with respect to the other remedies, it is well known, that not one of them operates upon the stomach alone; on the contrary, some of them act on other organs much more than upon the stomach. On taking a general view of the powers, which all the above remedies possess in common, we shall find, that they operate either by diminishing the irritability of the system in general, and of the kidnies in particular, or by communicating other motions to the system, and to the urinary organs; by both which means the morbid disposition impressed on the kidnies to secern a peculiar sweet urine may be abolished. Thus the benefit arising from the above remedies does not afford an argument for proving, that diabetes consists in a morbid state of the stomach. On the other hand, Dr. Brisbane has found the tinctura cantharidis, which, as is commonly known, particularly operates on the urinary organs, to be a powerful medicine to cure diabetes*: an evident sign, that the kidnies are to be looked upon as the seat of the disorder.

The fourth argument, of which Dr. Rollo makes use, is the condition of the blood altered from it's healthy state; for the doctor says, that though the blood, drawn in any period of the disease, was never found perceptibly sweet to the taste, except in Dobson's case, yet it's serum showed a wheyish appearance. This argument, I beg leave to ob-

* *Select Cases.*

serve,

ſerve, inſtead of demonſtrating, that diabetes is a diſeaſe of the ſyſtem in general, ſeems on the contrary a ſtrong proof, that it is nothing but a local diſorder of the kidnies; for the blood, according to the teſtimony of Dr. Rollo himſelf, is found deſtitute of all ſweetneſs, at the ſame time when the urine is found very ſweet: a manifeſt ſign, that in diabetes the ſugar does not pre-exiſt in the blood, and of courſe the formation of the ſaccharine matter is not effected by the ſtomach, but by the ſecerning veſſels of the kidnies. It is indeed true, that the blood is generally altered from it's healthy ſtate in inveterate diabetes, and it's ſerum ſhows a wheyiſh appearance. This change of the blood however is by no means to be looked upon as a cauſe, but as an effect of the diſeaſe; for in general diabetic patients do not ſeek for medical aſſiſtance, till the diſorder has continued ſome months; and it is a natural conſequence, that the blood of thoſe, who have laboured ſeveral months under this diſorder, ſhould ſhow ſome deviations from it's healthy condition. The change obſerved in the blood is therefore an effect of the diſorder, and by no means it's cauſe, and hence in an early period of diabetes theſe phenomena are often wanting, as Dr. Home found no appearance deviating from that of health, but a thick inflammatory cruſt, in the blood of one of his patients *.

Fifthly. The decreaſe of the quantity of urine being in proportion to that of the ſaccharine matter ſeems to Dr. Rollo, to be another argument ſup-

* L. l. p. 319.

porting his hypotheſis. According to the doctor's opinion, this phenomenon is to be accounted for from the correſponding diminution of the action of the kidnies, when the action of the ſtomach has been previouſly diminiſhed: ſince, if a change of ſtructure, of a nature different from mere enlargement, had taken place in the kidnies, the diminution of urine would not have been ſo ſpeedy and determinate. With regard to this I muſt remark, that the decreaſe of the quantity of urine is not always in proportion to that of the ſaccharine matter; for in the ſecond caſe recorded by Dr. Rollo, the patient being put upon animal food, his urine became ſaltiſh, yet it's quantity was four pints and a quarter, though the liquids taken were only four pints *. The patient, who was lately in Guy's hoſpital, when he had lived upon animal food and biſcuit for ſome weeks, and the ſweetneſs of his urine was quite deſtroyed, ſtill voided a great deal more than the quantity of liquid ſwallowed; the proportion being in general as eight pints to five. This is farther demonſtrated by the diabetes inſipidus, in which a conſiderable quantity of limpid urine, deſtitute of ſenſible ſweetneſs, is daily diſcharged. But ſuppoſing, that the decreaſe of the quantity of urine was truly always in proportion to that of the ſaccharine matter, nothing could be concluded from this, but that the ſecretory veſſels of the kidnies were in ſome meaſure reſtored to their uſual action. For the objection made by Dr. Rollo, that, if a change of ſtructure of a nature different from mere enlargement took

* L. l. vol. i. p. 117.

place

place in the kidnies, the diminution of urine would not have been ſo ſpeedy and determinate, is of no weight; as it is well known, that, by uſing powerful remedies, an abatement of ſymptoms may ſpeedily take place in diſeaſes, in which the afflicted organs undergo an undoubted change of ſtructure. For inſtance, in rachitis a change of ſtructure of the meſenteric glands takes place; and yet even in the higheſt degree of the diſorder, by making uſe of proper remedies, often a relief of all the ſymptoms is ſpeedily effected. In diſſections of perſons deſtroyed by ſcurvy a change of ſtructure of ſome organs is likewiſe evident *; yet a ſcorbutic patient, though ſeemingly half dead, is ſoon reſtored to his former health by a plentiful uſe of freſh vegetables. Theſe inſtances prove, that a change of ſtructure of the affected organ in ſome degree may exiſt, and ſtill a quick recovery may enſue: of courſe the ſpeedy reſtoration of the kidnies to their uſual office does not afford an argument for the opinion of Dr. Rollo. Laſtly, it ought to be obſerved, that, though in ſome caſes of diabetes a relief of the ſymptoms is quickly perceived, upon the whole the cure of this diſorder, far from being ſpeedily performed, is extremely tedious, and in general the kidnies are not reduced to their natural action but ſlowly and by degrees; eſpecially if the caſe have been of long ſtanding.

The ſixth and laſt argument of Dr. Rollo is taken from the appearances of the blood obſerved in his firſt patient before and after the uſe of animal food. The patient being bled previous to it, the ſerum of the blood had the appearance of whey,

* Lind, l. 1. pt. ii, chap. vii.

and the craſſamentum had a buffy coat of a bluiſh colour, ſimilar to what mercury ſometimes produces: whereas, after having made uſe for a long time of animal food, the blood was covered with a very thin pellicle of coagulable lymph of a looſe texture, reſembling the white of an egg, except which there was no other ſeparation of the parts exhibited. The phenomena obſerved after the two bleedings were not leſs different. After the firſt, the patient became lighter, and more cheerful; on the contrary, after the ſecond, he felt himſelf heavy and languid. Thus it appears, ſays the doctor, that an oppoſite ſtate of the ſyſtem had been produced; or that, by the uſe of animal food, the ſyſtem, from a hyperoxygenated ſtate, was brought into a deoxygenated one, approaching to that of curvy; into which diſeaſe diabetes thus probably may be changed by perſevering to live upon animal food.

Though to refute this argument it would be ſufficient merely to obſerve, that it is by no means aſcertained, that the ſame phenomena are conſtantly met with in diabetes; that from one ſingular caſe no general rule can be drawn, and that no hyperoxygenated ſtate takes place in this diſorder: nevertheleſs, that not the leaſt doubt may remain, I ſhall inquire a little more minutely into this argument. "The "patient being bled previous to the animal diet, "his blood had a buffy coat." But the buffy coat is by no means conſtantly met with in diabetes. In Dr. Dobſon's caſe the buff of the craſſamentum was very ſlight: in the other patients of Dr. Rollo no buffy coat has been mentioned: in the patients

of

of Dr. Frank the blood had no buff at all: and upon an accurate inquiry into the caſes, where a buffy coat was obſerved, we ſhall find, that it has been chiefly met with in patients of a ſanguine and irritable temperament; and that in theſe caſes either a conſtant pain was felt in the region of both kidnies; or a local pain in the thorax, a ſevere cough, and a difficulty of breathing, were preſent. In a word, we ſhall find, that in theſe caſes an inflammatory ſtate of the blood has been combined with diabetes; which being removed by bleeding, the patient of courſe was relieved. As to the looſe texture, and the other appearances of the blood obſerved after a long continuance of animal food: it is not yet proved, that living upon animal food for ſome time gives the blood a propenſity to diſſolution; and from one ſolitary inſtance no general rule can be laid down: particularly as it is evident from the example of ſome ſavage nations, that perſons enjoying good health may live chiefly upon animal food during their whole life, without experiencing ſuch effects.

But ſuppoſing, that it was always the caſe in diabetes, theſe phenomena would prove at moſt, that the blood in diabetes undergoes a change by living upon animal diet, and by no means, that the ſyſtem is reduced to an oppoſite ſtate: for we ſaw before, that the buffy coat is not always obſerved previous to the animal diet; that in diabetes no hyperoxygenated ſtate of the ſyſtem exiſts; and that the recommended animal food contains plenty of oxygen, conſequently it cannot poſſibly operate by abſtracting oxygen from the ſyſtem, and therefore no deoxygenated ſtate of the ſyſtem can be brought on by it's uſe. In fine, the aſ-

ſertion of Dr. Rollo, that the looſe texture of the blood after the animal diet proves an approach of the patient to ſcurvy, and thus that diabetes probably may be changed into this diſorder merely by perſevering to live upon animal food alone, ſeems to be very ill-grounded. For it appears, by the experiments made by Dr. Lind, that the blood even in the higheſt degree of ſcurvy is of a due firmneſs: and from my own experience I venture to ſay, that the blood, in the firſt ſtages of the ſcurvy at leaſt, is not at all of a looſer texture than ordinary. Of courſe the inference drawn by Dr. Rollo from the looſe texture of the blood falls to the ground. The more, as in the firſt ſtage of ſcurvy the ſolids alone are altered in their action, and not the leaſt diſorder of the fluids is to be obſerved, unleſs in thoſe organs, in which the ſcurvy has already made conſiderable progreſs. That in the patient of Dr. Rollo not the leaſt ſymptom of ſcurvy took place; and that the looſe texture of the blood, though it were always met with even in the commencement of the ſcurvy, is nevertheleſs inſufficient to prove the exiſtence of this diſorder, without being attended with the uſual ſymptoms of ſcurvy: ſince in putrid diſorders the blood is likewiſe of a looſe texture; I paſs over in ſilence: becauſe the above arguments are quite ſufficient to ſhow, that both the hyperoxygenated ſtate of the ſyſtem in diabetes, and it's change into ſcurvy, are founded upon a mere hypotheſis, contradicted by the very ſymptoms of the diſeaſe.

As thus the opinion of Dr. Rollo is unſupported by the phenomena of nature; ſo it is not proved,

even by a ſingle obſervation, that the ſtomach in any diſorder has the power of producing ſaccharine matter with ſubſtances capable of forming it, but it is all founded upon a mere ſuppoſition.

As Dr. Rollo, nevertheleſs, has attempted to eſtabliſh a noſologic ſyſtem in compliance with the doctrine of hyperoxydation and deoxydation; and as ſome phyſicians ſeem to embrace his opinion; before I proceed to propoſe the third opinion on the nature of diabetes, I cannot but in a curſory way take notice of this ſyſtem; which, if generally adopted, would no doubt cauſe more injury to mankind, than the new doctrine of chemiſtry has afforded benefit.

The extreme links of this ſyſtem are formed by diabetes and ſcurvy. Unqueſtionably the leaſt affinity does not exiſt between theſe diſorders: but is the ſyſtem in a hyperoxygenated ſtate in diabetes, and does an animal diet operate by abſtracting oxygen from it? We ſaw before, that both theſe are ſuppoſitions not founded on the obſervation of nature. In the ſcurvy, according to this ſyſtem, the body is in the higheſt degree of deoxydation. It is, however, a little difficult to be underſtood, how the ſyſtem can be induced into ſuch a deoxygenated ſtate, by living upon the uſual proviſion of a ſhip, ſome of which contains oxygen in a pretty large quantity. Beſides, as in compliance to this doctrine the appetite muſt be voracious, or at leaſt very keen in diabetes, in the ſcurvy of courſe we ſhould naturally expect to find the appetite quite loſt; this however is by no means the caſe, the appetite is generally good even for ſalt

meat. If the ſcurvy conſiſted in a deoxygenated ſtate of the ſyſtem, freſh vegetables would never be requiſite, as the quantity of oxygen wanting could be furniſhed by giving vinegar, elixir vitrioli, &c. But it is well known, that theſe remedies are of no uſe at all in this diſeaſe. If to cure the ſcurvy it were only requiſite to communicate freſh oxygen to the ſyſtem, nitrous acid, one of the chief remedies for imparting oxygen, no doubt would prove uſeful in this diſorder. Yet Dr. Trotter, one of the chief advocates of the pneumatic doctrine, confeſſes himſelf, that nitre diſſolved in vinegar did not produce any favourable appearances in a hundred and fifty-two caſes of ſcurvy *; an evident proof, that the cure of the diſorder does not conſiſt merely in ſupplying freſh oxygen to the ſyſtem.

Syphilis, according to this opinion, differs only from the ſcurvy as to it's degree; namely, though the ſyſtem is in a deoxygenated ſtate in both diſorders, yet the degree of deoxydation is leſs in the lues than in the ſcurvy. If this were really ſo, the natural inference would be, that the preparations of mercury ſhould prove ſalutiferous in both by ſupplying oxygen to the ſyſtem; and though they could not furniſh a ſufficient quantity of oxygen to perform a radical cure of the ſcurvy, at leaſt when theſe two diſorders are united, they would cure the lues, and even abate the ſymptoms of the ſcurvy; whereas the preparations of mercury are found ſo contrary to the nature of the ſcurvy, that not only in this diſorder, but even in the lues when combined with a ſcorbutic diatheſis of the ſyſtem, the

* Rollo, vol. ii.

prepa-

preparations of mercury occaſion the greateſt injury to the conſtitution, and cannot be given with ſafety, before the ſcurvy has been cured. If the lues depended on the ſame cauſe as ſcurvy, but inferiour in degree; it would not be neceſſary to have recourſe to mercury or to nitrous acid; and no patient, though labouring under the higheſt degree of the venereal diſeaſe, would want the aſſiſtance of any medical man; he need do nothing more than eat plenty of oranges, by uſing of which in a large quantity, eſpecially in conjunction with a vegetable diet, the ſyſtem would be ſoon reduced to it's requiſite ſtate of oxygenation, and thus the diſorder would eaſily be eradicated, and in a very pleaſant manner.

In the inflammatory diſeaſes no doubt an exceſs of oxygen exiſts; accordingly animal diet, confinement, opium, hepatiſed ammonia, and other ſedatives, ought to be employed: that is, if the diſorder conſiſt merely in a hyperoxygenated ſtate of the ſyſtem, but it is well known, that in phlegmonic inflammations both animal food and opium are injurious; and on the contrary vegetables, though containing plenty of oxygen, are highly beneficial. Hence it appears, that the exceſs or want of oxygen in the ſyſtem is not the cauſe of diſeaſes, but the effect of them, and to be remedied by the removal of the diſorder itſelf.

It would be eaſy to add to theſe examples, were not the inſtances, which I have already given, quite ſufficient to ſhow, that, as on one ſide the phyſicians, who deny the influence of the chemical powers in the animal economy, and the great ad-

vantages, which neceſſarily muſt reſult from a prudent application of the new diſcoveries of chemiſtry to the healing art, in compliance to mere cuſtom, and the doctrine of the ancients, willingly ſhut their eyes againſt truth and daily experience; ſo likewiſe on the other hand, on conſidering the animal frame, we are taught that a living body is by no means a mere pneumatic machine, but that the chemical powers, when applied to it, operate in a far different manner from what they do when applied to inanimate matter; for in the living body they are modified by the vital principle; that, therefore, all chemical operations in the animal body are to be looked upon as compound reſults of the chemical powers, and of thoſe which are added to them by the conjunction with the vital powers, and theſe actions may juſtly be called chemico-animal; that though in many diſorders the chemical powers act with more force than in health, yet, as long as the leaſt ſpark of life remains, an action merely chemical does not take place in the human body, and of courſe the ſcheme of curing diſorders merely by hyperoxygenating and deoxygenating the ſyſtem, is not practicable, is capable of leading phyſicians into frequent miſtakes, and therefore upon the whole cannot but prove injurious to mankind. Thus omitting all farther animadverſion on this theory, I ſhall only obſerve by the by, that the imperfections and deficiencies of this ſyſtem are ſo obvious, as to have made ſome impreſſion even upon the chief advocates of the pneumatic doctrine, as will appear from an extract of a letter written by the celebrated Dr. Beddoes, before a great partiſan of the pneumatic doctrine,

to

to Dr. Rollo. " You ask my present opinion on " consumption. Allow me generally to say, I " have now no chemical theory of any one disease. I " never held any such opinion. In different ways " (at lectures and in publications) I started con- " jectures to be compared with facts; and now I " think all those conjectures are shown to be erro- " neous by facts. I used to think my hypothesis " on scurvy very probable, and I was confirmed " in this idea by Dr. Trotter. But I at present " think we are both mistaken*." Thus there is reason to expect, that, upon more mature reflexion on the animal economy, both in the healthy and morbid state, the pneumatic physicians will change their opinion.

The third opinion, according to which diabetes is a local disorder of the kidnies, already proved in part by the critical remarks I have made on the former hypotheses, is farther confirmed by the following circumstances.

1, By the function of the kidnies in the healthy state. It has been the general opinion till lately, that the secerned fluids pre-existed in the blood, and passed through their organs as it were through a sieve. Some years ago, however, physiologists, considering the peculiar structure of the secerning vessels, the difference of the secerned fluids from the blood as to their chemical properties; that no liquor having resemblance with any of the secerned fluids can be prepared by chemical means from the blood; the peculiar functions which they serve to

* Rollo, l. l. vol. ii, p. 8.

perform;

perform; and the changes, which they undergo in different diſorders; conceived, that all theſe phenomena could not be explained, without having recourſe to a peculiar power reſiding in each ſecretory organ, by which the blood flowing to it is changed into a fluid of a peculiar kind. This opinion is at preſent generally adopted. But though the medical men of the preſent day moſtly agree, to grant to each ſecretory organ the faculty of converting the blood into a peculiar fluid, yet ſome of them ſtill conſider the kidnies as ſieves, by which a conſiderable quantity both of ſaline and other matters noxious to the animal economy is diſcharged from the body; being confirmed in this idea, by the circumſtance, that the ſmell and colour of many ſubſtances taken, which cannot be converted into a nutritious liquor, are obſerved within a few hours afterwards in the urine. This denial, however, to the kidnies of the faculty granted to all other ſecerning organs is in my humble opinion quite inconſiſtent with the laws of ſecretion. Indeed the conſideration of the beautiful ſtructure of the veſſels of the kidnies is alone ſufficient to prove, that theſe organs are deſtined to ſecern a peculiar kind of fluid, but by no means like a ſieve to let all fluids noxious to the animal economy paſs through them. The urine pre-exiſts in the blood as little as any other ſecerned fluid; but is formed by the ſecerning veſſels of the kidnies. No chemiſt is able to draw urine from the blood, but it is a fluid of a peculiar kind, as to it's chemical properties, quite different from the blood. If the urine thus poſſeſs all the characters common to the ſecerned fluids, why is the faculty of converting the blood into a peculiar

fluid,

fluid, granted to all other ſecretory organs, to be denied to the kidnies? The leſs, as an acid of a peculiar kind, not to be obtained either from the blood, or from any other animal fluid, may be extracted from the urine: an unequivocal ſign, that this fluid does not merely paſs off by the kidnies as through a ſieve, but that theſe organs, being ſpecifically ſtimulated by the blood, react ſo as to form the urine in conſequence of this ſtimulus.

It may perhaps be argued, that the urine, being an excrementitious fluid, cannot be a product of ſecretion; that the quantity of urine increaſes or diminiſhes in proportion to the liquids taken; and that the ſmell of ſome ſubſtances, ſuch as oil of turpentine, may eaſily be diſcovered in the urine. To theſe objections I anſwer, that it is a matter of indifference, whether the fluid to be formed by the ſecretory organ be excrementitious or not. It is quite ſufficient, that it ſhows peculiar properties, not to be met with in the blood: for the quality of the ſecerned fluid depends both upon the ſtructure of the ſecerning organ, and the ſpecific ſtimulus it receives from the blood, in the compound ratio of which all ſecretions are performed.

It is indeed true, that the ſecretion of urine is increaſed by taking liquids in large quantity. Nothing, however, can be concluded from this; for they operate only as ſtimuli to excite the action of the kidnies; as it is well known, that not the liquid taken, but urine, is expelled from the body. In fine, the ſmell and colour of ſome ſubſtances obſerved in the urine ſhow only, that they are incapable

pable of being changed into an animal fluid by the powers of nature. Now as the kidnies, when in a healthy ſtate, in conſequence of their peculiar ſtructure ſeparate from the blood matters that would prove noxious to the animal economy, it is not to be wondered, that theſe ſubſtances alſo are ſeparated from the blood by the kidnies, and thus expelled the body with the urine.

Though thus the fluid ſecerned from the blood by the kidnies is excrementitious according to the laws of health, nevertheleſs the kidnies, in the ſame manner as all other ſecretory organs, may be altered in their action by morbid ſtimuli, ſo that, operating in a quite different manner, they may ſecern, inſtead of the ordinary urine, a fluid as to it's properties partly or altogether different from it.

2, The nature of the diſorder. In the diabetes inſipidus the ſecerned fluid in many reſpects ſtill partakes of the nature of urine, and the preternaturally increaſed quantity of the ſecerned liquid is the chief morbid appearance that is to be obſerved. Now it is well known, that every ſecretion is increaſed by the application of ſtimuli; and that the medicines, which ſtimulate the urinary ſyſtem (diuretics), excite an extraordinary ſecretion of urine. Of courſe it is highly probable, that the increaſed ſecretion of urine in diabetes is occaſioned by a morbid ſtimulus, which, exciting the ſecretory organs of urine, produces, according to their different reaction, an increaſe of either inſipid or ſweet urine.

3, The

3. The cauſes of diabetes often clearly prove, that a morbid ſtimulus diſturbs the action of the kidnies. Sydenham has obſerved this diſeaſe from the healing up of an inveterate ulcer. Whytt and Corwick witneſſed diabetes brought on by repelled gout *: Dr. Webſter has ſeen diabetes produced by the retropulſion of the itch †: Dr. Rollo's ſecond patient had been ſubject to the piles previous to the diſorder ‡: Dr. Hope's patient got the diſeaſe from a ſuppreſſion of perſpiration: the patient of Dr. Falconer became diabetic from drinking large quantities of ſpruce beer §: and profeſſor Richter, of Goettingen, has ſeen two inſtances, in which it was evident, that the diſorder aroſe from a morbid ſtimulus operating on the urinary ſyſtem. The firſt of theſe patients had previouſly laboured under a bilious fever, which was indeed removed, yet, though the fever was gone, the patient was not perfectly reſtored, and within a fortnight afterwards was attacked with diabetes. As the anxiety and a ſenſe of fulneſs in the region of the ſtomach, a foul tongue, a ſmall, quick pulſe, and the increaſe of all the ſymptoms toward the evening, ſeemed to indicate, that vitiated bile was ſtill lodged in the ſtomach, an emetic was given, by means of which a great quantity of bilious matter being thrown up, the diabetes directly diſappeared, and the patient perfectly recovered. The other got the diſorder from ſuppreſſion of perſpiration. Antimonials and

* *Opera*, p. 597: and *Med. Comment.* vol. ix.

† Sandifort, *Bibliotheca med. et Phyſ.* vol. vi.

‡ L. l. vol. i, p. 74.

§ L. l. vol. ii, p. 23 and 24.

the

the warm bath removed the malady for a time; but it returned twice. On ſome ſcorbutic ſymptoms appearing, wort was given him to drink, during the uſe of which the diabetes by degrees diſappeared *. Now if we take a general view of all theſe caſes, we ſhall ſee our opinion clearly demonſtrated: for it is pretty evident, that a conſolidated ulcer, repelled gout or itch, ſuppreſſed hemorrhoids, corrupted bile in the ſtomach, drinking of a large quantity of ſpruce beer, or ſuppreſſed perſpiration, cannot produce diabetes by impeding the powers of ſanguification, or by hyperoxygenating the ſyſtem; but that they operate as ſo many morbid ſtimuli, by altering the action of the urinary organs.

Diabetes therefore is by no means a diſeaſe of the ſyſtem in general, or of the ſtomach, but is a local diſorder of the kidnies; and the ſaccharine matter, which is found in the urine of thoſe, who labour under diabetes, is an effect of a ſpecific reaction of theſe organs produced by the morbid ſtimulus.

4, The ſymptoms, with which diabetes is attended, likewiſe ſhow, that the ſource of the diſorder is to be looked for in the kidnies. For a pain or at leaſt an uneaſy ſenſation at the region of the kidnies is a conſtant ſymptom in this diſeaſe. This is not only proved by the obſervations of Richter and Frank, but in all the caſes, recorded by Dr. Rollo, this ſymptom occurred. This uneaſy ſenſation, however, is not always ſo ſtrong as to deſerve the name of pain; on the contrary, nature grows as it were accuſtomed to it in time; and

* L. l. p. 78 and 79.

this

this ſeems to be the reaſon, why it is ſometimes overlooked in enumerating the ſymptoms of diabetes; though upon a more minute inquiry it will be found, that this ſymptom has always been preſent in the beginning of the diſorder. The patient, who was lately in Guy's Hoſpital, did not make any mention of an uneaſy ſenſation in the region of the kidnies among his complaints: however upon a more particular inquiry into his ſymptoms, he told me, that, at the time the diſorder was coming on he had felt an uneaſy ſenſation at the ſeat of the kidnies, which uneaſy ſenſation always became worſe previous to the voiding of urine; a phenomenon, which, as far as I know, has not been noticed, except by profeſſor Richter, who records, that he conſtantly met with this ſymptom in all his patients. It is indeed true, that a keenneſs of appetite, an uneaſineſs in the region of the ſtomach, a diſtreſſing thirſt, acidity of the *primæ viæ*, a dry parched ſkin, and a quick pulſe, are beſides for the moſt part obſerved in diabetes. But it has been obſerved above, that theſe ſymptoms are only to be imputed to the ſympathy exiſting between the kidnies and the ſtomach; that the appetite may fail, or be diminiſhed, without any decreaſe of the diabetes; and that theſe ſymptoms are therefore generally leſſened or increaſed by the increaſe or diminution of the urine. The exceſſive thirſt, keenneſs of appetite, and dryneſs of the ſkin, are not eaſy to be explained in ſuch a way; but from this, that nature always attempts to repair her loſſes, and that the ſecretion of any organ being conſiderably increaſed, the blood is ſolicited to that organ, and the other ſecretions are in proportion diminiſhed.

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The ſymptoms of diabetes thus afford a freſh argument to prove, that this diſeaſe is a local diſorder of the urinary ſyſtem.

5, The medicines, by which diabetes is often cured, no leſs corroborate this opinion of the ſeat of the diſorder. Dr. Richter has cured two diabetic patients, in whom the cauſe of the complaint did not appear, the one by ipecacuanha, and the other by ſmall doſes of emetic tartar united with valerian *. Corwick has removed it by Dover's powder †. Briſbane has found the tincture of ſpaniſh flies, and emulſions with camphor, very efficacious ‡. Dr. Rollo has removed diabetes by emetics, kali ſulphuratum, hepatiſed ammonia, laudanum, iſſues, and living upon animal food §. Dr. Darwin has experienced much benefit from large doſes of opium in reducing the quantity of urine ‖. Mr. Scott has twice cured diabetes with mercury and nitrous acid, after many other remedies had been tried in vain ¶. Dr. Beddoes mentions a caſe of a diabetic patient, three times cured by uſing the Briſtol water **. The patient lately in Guy's Hoſpital was very much relieved by the uſe of the tincture and infuſion of ſpaniſh flies; and my worthy friend Dr. Woodville, phyſician to the Small Pox and Inoculating hoſpital, has alſo lately experienced much benefit from the tinc-

* L. l. p. 81.

† *Med. Comment.* vol. x.

‡ *Select Caſes.*

§ L. l. vol. i.

‖ Rollo, l. l. vol. i, p. 192.

¶ Rollo, l. l. vol. i, p. 203.

** Rollo, l. l. vol. ii, p. 7.

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ture of ſpaniſh flies, given in large doſes, in a diabetic patient.

If we take a general view of all theſe remedies, we ſhall find, that they are neither able to reſtore the powers of aſſimilation and ſanguification when weak; nor can poſſibly operate by deoxygenating the ſyſtem, as ſome of them contain a conſiderable quantity of oxygen: but that they all act, either by diminiſhing the irritability of the kidnies to the ſtimulus, or by communicating new motions to them; by both which means the morbid ſtimulus may be removed; that is, they all operate as anti-ſpaſmodics or anodynes. The cure of diabetes by ſuch remedies therefore affords a freſh argument to ſhow, that diabetes is not a diſeaſe of the ſyſtem in general, but a local diſorder of the kidnies; and thus of courſe the effect of it, that is, the ſecretion of a peculiar urine, poſſeſſing a large quantity of ſaccharine matter, is to be imputed to the altered action of the ſecerning veſſels of the kidnies.

6, As the nature, cauſes, ſymptoms, and cure of diabetes evidently ſhow, that this diſorder depends upon a morbid ſtate of the kidnies, the ſeat of the diſeaſe is likewiſe put beyond all doubt by the diſſections of ſuch bodies, in which the kidnies are always found in a greater or leſs degree in a preternatural ſtate, and ſometimes very much enlarged and relaxed *. Let it not be objected, that

* Morgagni, de *Sedibus & Cauſ. Morb.* vol. ii, epiſt. 41, N. 15, & 42, N. 13: Ruyſch, *Opera Omnia*, vol. i, obſ. 13: Bonnetus, *Sepulchretum anat.* T. ii, lib. 3, ſect. xxxvi: Rollo, l. l. vol. i, p. 115, & vol. ii, p. 5: and more eſpecially the excellent work of the celebrated phyſician and anatomiſt Baillie, p. 275.

the morbid appearances obſerved in the kidnies are the effects of the diſorder, and not it's cauſe. For, beſide that the nature, cauſes, ſymptoms, and cure of diabetes prove, that it is owing to a morbid ſtate of the kidnies, there are always obſerved, upon accurate examination, ſome changes of the ſtructure of the kidnies in any period of the diſorder: not to mention, that it would ſeem a little paradoxical to maintain, that the ſtructure of the kidnies has undergone theſe changes in conſequence of the diſeaſe, while not the leaſt change of ſtructure is uſually to be obſerved in the ſtomach, or lymphatic ſyſtem, the ſources of diabetes according to the former opinions. As thus the nature, cauſes, ſymptoms and treatment of diabetes clearly demonſtrate, that this diſeaſe is a morbid ſtate of the kidnies, and this is farther confirmed by the diſſections of ſuch bodies, it follows of courſe, that the ſaccharine matter found in the urine of ſuch patients muſt derive it's origin from an altered action of theſe organs.

7, It is alſo by no means uncommon, for the ſecretory organs of urine, when ſpecifically ſtimulated, to ſecern urine of a peculiar kind; as, on the contrary, this frequently happens in many diſeaſes. Thus, for inſtance, in the inflammatory fever, inſtead of the ordinary fluid, urine of a flame-colour is ſecerned; in bilious fevers the urine becomes like that commonly voided by a horſe; in hyſterical patients a pale almoſt colourleſs urine is ſecerned in a large quantity; in worm diſeaſes the urine very often reſembles a milky fluid; in jaundice the urine becomes dark yellow, or croceous;

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in hectic fever an urine is ſecerned of an orange colour; in chronic diſeaſes in atrabilious conſtitutions a greeniſh urine is not unfrequently met with; and in acute fevers, eſpecially when growing worſe, the urine is often changed into a blue, livid, or black fluid. Thus we ſee how many changes the urine is capable of, when the ſecerning veſſels of the kidnies become preternaturally ſtimulated. It is of courſe not any way ſtrange, that in diabetes, a fluid as to it's colour, ſmell, taſte, and conſiſtence, different from ordinary urine, is ſecerned.

8, Laſtly, that the ſaccharine matter is formed by the kidnies is put beyond all doubt by the experiments made by Dr. Dobſon and Dr. Rollo. According to the analyſis of the human milk by Young and Voltelen, twelve ounces of this liquid contain ʒiii of ſugar; but the ſame quantity of urine in the diabetic patient of Dr. Dobſon yielded ʒviiiſs. In the caſes recorded by Dr. Rollo the proportion was as follows. In the firſt caſe a pound of urine contained ʒix of ſugar *; in the ſecond caſe, ʒviii ℈i †; in the third, ʒviii ‡; in the fourth, ʒviii §; and in the fifth, more than ʒxiv ‖. Now from what ſource is this conſiderable quantity of ſaccharine matter to be derived? By no means from the powers of ſanguification, becauſe theſe would change the chyle into blood, from which no ſaccharine matter can be extracted. And as little from the morbid

* Rollo, vol. i, p. 4.
† Vol. i, p. 85.
‡ Vol. ii, p. 34.
§ L. l. p. 48.
‖ L. l. p. 74.

ſtate of the ſtomach, producing from ſubſtances capable of forming it ſaccharine matter: for the quantity of ſugar, which may be had from the urine of ſuch patients, is much greater than poſſibly could be extracted from the ſubſtances taken by the ſtomach; ſuppoſing this organ poſſeſſed ſuch faculty, becauſe the urine diſcharged in diabetes is generally equal to all the food and drink, and very often far exceeds them.

It follows therefore that we muſt have recourſe to a peculiar action of the kidnies in order to account for the formation of ſuch a conſiderable quantity of ſaccharine matter.

Diabetes may thus be defined to be an alteration of the action of the kidnies, by which a conſiderably increaſed ſecretion of urine generally more or leſs ſweet, takes place.

The diſorder is attended with a dry parched ſkin, pain or uneaſineſs at the region of the kidnies, increaſed previous to the diſcharge of urine, and a diſtreſſing thirſt, to which ſymptoms, eſpecially in the diabetes mellitus, are commonly added a palpitation of the heart, keenneſs of appetite, an uneaſy ſenſation at the region of the ſtomach, with a ſtrong tendency to acidity in it, cough, and a ſmall quick pulſe.

There are two ſpecies of this diſorder. In the one the urine is inodorous, of a pale colour, and not ſweet to the taſte. In the other the urine reſembles as it were a watery ſolution of brown ſugar,

and

and is remarkably ſweet both to the ſmell and taſte. Whether no ſaccharine matter at all may be obtained from the urine voided in the diabetes inſipidus is hitherto not aſcertained; the analogy, however, which exiſts between the two ſpecies, and the various changes, which the urine undergoes even in the diabetes mellitus during the courſe of the diſeaſe with regard to it's degree of ſweetneſs, ſeem to prove the contrary. This opinion becomes confirmed, on conſidering, that the ſame characteriſtic ſymptoms occur in both, and that Dr. Frank has cured both theſe ſpecies of diabetes with the ſame remedies*: though this phyſician obſerved the diabetes mellitus to yield much ſlower than the inſipidus to the uſe of medicines, and it's cure is generally tedious, I therefore ſtrongly ſuſpect, that, upon accurate examination, ſaccharine matter can be likewiſe drawn from the urine in the diabetes inſipidus; though not in ſuch a conſiderable quantity, as from the urine of a patient, who labours under the diabetes mellitus.

As all other diſeaſes ſo diabetes has likewiſe it's prediſpoſing and occaſional cauſes. The prediſpoſition to diabetes ſeems to conſiſt in a certain degree of weakneſs, either of the whole ſyſtem, or of the kidnies alone. I am inclined to believe this, becauſe diabetes is not unfrequently met with in the convaleſcent from fevers, eſpecially when obliged to work hard; becauſe this diſorder may be brought on by exceſſive indulgence in ſpruce beer, or by taking large draughts of warm water; and laſtly,

* *Ratio Inſtituti clinici ticinenſis*, cap. viii, p. 201.

becauſe authors of very high reputation record, that perſons debilitated either by former diſeaſes, or by any other cauſe, are found to be very liable to this diſorder *. It is not requiſite to diabetes, however, that the patient be weakened by ſome previous diſorder; as without any debility of the ſyſtem a local weakneſs of the kidnies can take place, which, in conjunction with a proper occaſional cauſe, is ſufficient for the production of diabetes.

The exciting cauſes of this diſorder are all morbid ſtimuli, which by irritating the kidnies alter their action; as we have ſeen above, that by ſuppreſſion of reſpiration or hemorrhoids, conſolidation of an inveterate ulcer, retropulſion of gout, or itch, &c., in prediſpoſed habits, diabetes is produced. Nay, the action of the morbid ſtimulus may be ſo forcible, that, without any previous weakneſs of the kidnies, diabetes may be brought on merely by the too violent irritation; while in debilitated perſons even ſlight ſtimuli, which when operating upon thoſe in ſound health would have no effect at all, are capable of producing the diſeaſe.

The proximate cauſe of diabetes thus, in my humble opinion, conſiſts in a certain degree of debility of the kidnies, combined with morbid increaſed irritability of theſe organs.

* Sydenham, *Opera Omnia*, p. 307, 308, & 618: Buchan's *Domeſtic Medicine*, chap. 32: Macbride, *Introductio Methodica in Theoriam, et Praxin Medicinæ*, p. 225: Burſerius, *Inſt. pract.* vol. iv, p. 491: & Frank, l. l. p. 202.

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Though the diſorder is generally ominous, difficult to be remedied, and often terminates in death, particular attention ought to be paid to the following circumſtances in it's prognoſis.

1, The different ſpecies of diabetes. *Ceteris paribus*, the diabetes mellitus is more dangerous than the inſipidus; it is always found difficult to be removed, and often proves fatal *. The reaſon, why the diabetes mellitus proves more dangerous than the inſipidus, ſeems to be becauſe in the latter the body is only weakened by the irritation of the morbid ſtimulus; whereas in the former, the ſyſtem ſuffers not only by ſympathy, but beſides a conſiderable quantity of the blood is exhauſted in the generation of this ſweet urine, and of courſe the reſt of the blood becomes incapable of affording proper nouriſhment to the ſyſtem.

2, The remote cauſes of the diſeaſe. For as the morbid ſtimuli are more or leſs difficult to be removed, the hope of recovery is likewiſe ſmaller or greater. Thus, for inſtance, diabetes, when ſucceeding to malignant fevers before the criſis, is almoſt always fatal. When convaleſcents from fevers are attacked with this diſorder, the ſituation of the patients, though not ſo dangerous as in the former caſe, is ſtill very critical: for here patients ſcarcely poſſeſſing ſufficient ſtrength to perform the functions of the animal economy, are ſeized afreſh with a dreadful dibilitating diſorder. On the contrary, if diabetes ariſe either from ſuppreſſed per-

* Frank, l. l. p. 205 and 206: and Rollo, l. l. vol. ii, p. 9.

ſpiration, or from ſordes of the *primæ viæ*, the prognoſis is more favourable; and the malady, eſpecially in it's commencement, may be removed without great difficulty, and in a ſhort ſpace of time *.

3, The degree and duration of the diſeaſe. For a ſlight degree of diabetes is not only curable, but is often ſoon remedied †; becauſe the danger varies according to the greater or leſs violence of the morbid ſtimulus, and the different re-action of the ſecretory organs, in the compound ratio of which are the quantity and the quality of the ſecerned fluid. This ſeems in a great meaſure to explain, why diabetes proves in ſome caſes a very rapid conſumption; as Dr. Dobſon has known it to terminate fatally in leſs than five weeks, and the patient of Dr. Ooſterdyk died on the tenth day of the diſorder: while in other caſes, on the contrary, it is a chronic complaint; though it is not to be denied, but that this is partly to be imputed to the keenneſs of appetite of the patients, which in ſome meaſure happily keeps pace with the neceſſities of the ſyſtem. The duration of diabetes is not leſs to be conſidered. Thus Dr. Richter has cured the higheſt degree of diabetes, when only in it's commencement, in a few days ‡: whereas, if the diabetes have been of a very long ſtanding, the cure is more difficultly obtained, the diſorder then ſcarcely yields to the moſt powerful medicines,

* Richter, p. 78 and 79.

† Burſerius, l. l. vol. iv, p. 491.

‡ L. l. obſ. xxiv and xxv.

and

and ſometimes it proves incurable; both becauſe the morbid diſpoſition to ſecern a ſweet urine, when it has been impreſſed on the kidnies a long ſpace of time, becomes as it were habitual to them, and is afterwards difficult to be removed; and becauſe the morbid ſtimulus, when not deſtroyed, continually operates on the ſecerning veſſels of the kidnies, which of courſe become daily more and more perverted from their uſual office, and at length wholly depraved, that is, a total alteration of their ſtructure takes place. Hence the longer diabetes has continued, the more difficult it is in general to be removed, ſo that when inveterate it is very often found to defy the powers of art.

4. The age and conſtitution of the patient. For perſons in a declining ſtage of life are ſeldom radically cured. In old people the diſorder is of the chronic kind; the patients are as it were worn out, and at laſt a hectic fever comes on, which terminates in death. The reaſon ſeems to be, that the vital principle cannot be ſufficiently ſtimulated to reſiſt the morbid ſtimulus; and becauſe the morbid diſpoſition to ſecern a ſweet urine being once impreſſed on the kidnies is very difficult to be aboliſhed; ſince the ſolids are by no means ſo able to undergo different changes in people of an advanced age, as in young perſons. It needs ſcarcely to be mentioned, that cachectic perſons, or thoſe who are debilitated by drinking or venery, when attacked by diabetes, are generally ſoon carried off*; as it is

* Buchan, l. 1. chap. xxxii.

evident,

evident, that their unhealthy and enfeebled bodies cannot reſiſt the morbid ſtimulus with the requiſite force, but muſt ſoon yield to it.

With reſpect to the treatment of this diſeaſe, if we conſult authors about it, we ſhall meet with the greateſt contradictions: for while ſome aſſert, that tonics and aſtringents are the moſt powerful remedies, ſo others on the contrary are of opinion, that they are at beſt uſeleſs, and often miſchievous, but that the utmoſt ſucceſs is to be derived from antiſpaſmodics and anodynes. On both ſides are men of very high reputation, and both found their opinion on their experience. If, however, we conſult nature, the matter will ſoon be ſettled, for as diabetes may ariſe from very different cauſes, the natural inference muſt be, that there is no ſpecific for this diſeaſe, but that it's cure is to be founded on general principles; that is to ſay, the diſeaſe is to be removed by the removal of it's cauſe. In all caſes of diabetes therefore the treatment ought to be ſuited to the nature of the morbid ſtimulus, which has given riſe to the diſeaſe. Of courſe if diabetes be produced by ſuppreſſed evacuations, theſe are to be reſtored; if the diſorder be occaſioned by repelled cutaneous eruptions, theſe are to be brought back again to the ſurface; if by ſuppreſſed perſpiration, antimonials, ſpiritus Mindereri, opium, ipecacuanha, and the warm bath, are efficacious.

Diabetes may ariſe from various other cauſes, but it's two chief ſources are a morbid ſtate of the *primæ viæ*, and a preternatural affection of the

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lymphatic ſyſtem: for though it has been a miſtaken notion of Dr. Rollo, that the ſeat of diabetes is in the ſtomach, yet the remote cauſe of the diſeaſe is frequently to be looked for in the *primæ viæ*. Dr. Richter cured diabetes originating from a bilious matter in the ſtomach by giving an emetic. And vomits are truly uſeful in diabetes in many reſpects; for in all caſes, where the cauſe of diabetes is in the ſtomach, by taking away the cauſe, they remove the diſorder itſelf. Beſides, the action of the ſtomach is very generally diſturbed in this diſeaſe, both by the ſympathy between the kidnies and the *primæ viæ*, and by the ſudden change of diet. Hence though the diabetes do not originate from a morbid ſtate of the *primæ viæ*, yet ſordes of the alimentary canal are moſtly met with in this diſeaſe; which conſiderably aggravate the ſymptoms, ſo that the removal of them cannot but give ſome relief to the patient. In all caſes, during the whole courſe of the diſeaſe, the *primæ viæ* are, therefore, to be kept clean by the occaſional exhibition of emetics and purgatives. Of the latter calomel and rhubarb beſt anſwer the purpoſe. Laſtly, emetics are often found very beneficial in this diſeaſe, on account of other motions communicated to the kidnies by their ſhaking the whole ſyſtem, and by their diminiſhing the irritability in conſequence of the relaxation ſucceeding to vomiting; though it muſt be obſerved, that in caſes, where great debility and relaxation of the ſyſtem take place, emetics are either wholly to be omitted, or at leaſt we ought to be cautious in their exhibition.

That

That diabetes very often originates from the morbid ſtate of the lymphatic ſyſtem is placed beyond all doubt, by the very ſymptoms with which the diſeaſe is frequently attended; for the urine diſcharged in diabetes often exceeds the quantity of ingeſted food and drink in a conſiderable degree. It would be eaſy to prove this by many inſtances, but for brevity ſake I ſhall only mention a few ſtriking ones. Dr. Dickſon records, that a diabetic patient paſſed off ſix or ſeven pints of urine in twenty-four hours, though his drink during that time did not exceed four pints, and his appetite was quite gone; nevertheleſs he lived under the diſorder more than ſix weeks*. In the firſt patient of Dr. Rollo the quantity of urine exceeded the quantity of drink taken by nearly one half†. Dr. Ooſterdyk mentions a caſe of a diabetic patient, who voided every twenty-four hours at leaſt ſeven pints of urine, and ſometimes as far as ten pints, though his drink was at the moſt only one pint and a half during that time‡. Dr. Richter ſaw a patient, who paſſed every day thirty pounds of urine, and notwithſtanding had laboured under this diſorder four weeks, before he came under his care, without having contracted any conſiderable degree of weakneſs§. The urine of the patient, who was lately in Guy's hoſpital, daily exceeded by about one half the drink taken during the courſe of ſeveral weeks. Now as it is evident, that the

* *Med. Obſ. and Inquir.* vol. iii, p. 140.

† L. l. vol. i, p. 159.

‡ L. l. vol. xii.

§ L. l. p. 140, in a note.

bodies

bodies of ſuch perſons, though wholly changed into fluid, would ſtill prove incapable of ſupplying ſo great a loſs during ſome days, and much leſs during ſo long a time, it muſt be concluded from theſe inſtances, that the water is abſorbed from the atmoſphere by the lymphatics.

Nay, evident ſymptoms of the morbid ſtate of the abſorbent ſyſtem not unfrequently appear in diabetes in theſe caſes. Dr. Dickſon obſerves, that the urine of his patient was conſtantly found conſiderably increaſed on moiſt and rainy days, though the drink fell ſhort of the uſual quantity: and Dr. Dobſon records, that his patient had ſometimes for five or ſix days together the ſymptoms of an aſcites, the belly ſwelled, and there was an evident fluctuation in it*. In theſe caſes, if the phyſician attempt to check the quantity of urine by the exhibition of aſtringents, eſpecially of the foſſile kingdom, the conſequence is, that, though the diſcharge of urine is conſiderably diminiſhed, ſtill the patients do not experience relief; for the abſorbent veſſels continuing to attract water from the atmoſphere, at the ſame time that the urinary organs are hindered, by the uſe of aſtringents, from expelling the quantity taken in, the natural conſequence is, that the abſorbed fluid is poured out into the cavity of the abdomen, and the patient becomes dropſical. Of this Dr. Babington experienced a remarkable inſtance in Guy's hoſpital. He gave the patient already ſpoken of the alum whey, when his urine conſiderably diminiſhed, but his abdomen ſwelled, and an evident fluctuation

* *Med. Obſ. and Inquir.* vol. v, p. 300.

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was obſerved in it. This ſituation diſtreſſed the patient ſo much, that the phyſician was obliged to leave off the aſtringents, and to have recourſe to ſquills, by which the ſecretion of urine being promoted, this dropſical diſpoſition gradually went off. In theſe caſes the remedies, which diminiſh the irritability of the ſyſtem in general, and of the abſorbents in particular, ſuch as opium, cicuta, belladonna, hyoſciamus, kali ſulphuratum, hepatiſed ammonia, and eſpecially the preparations of cantharides, are the beſt calculated to put a ſtop to this inordinate action of the abſorbent veſſels.

But though the fact is, that no ſpecific for diabetes exiſts, that the treatment of the diſeaſe is to be ſuited to the nature of it's exiſting cauſe, and of courſe that the phyſician ought always minutely to inquire after this; yet we are frequently called upon in caſes, in which, after the moſt careful inveſtigation of the diſeaſe, the cauſe is not to be diſcovered.

For this there appear to be two reaſons. In the firſt place, diabetes uſually comes on by degrees, and from it's not being attended with much pain or uneaſineſs the patient is ſtill able to go through his daily occupations, and in conſequence does not ſeek for any medical aſſiſtance, till he has laboured under diabetes during a long ſpace of time. In the ſecond, it ſeems, that frequently the cauſe of the diſorder may be removed, without it's effect, the diabetes, ceaſing at the ſame time; on account of the habitual diſpoſition to ſecern a ſweet urine impreſſed on the kidnies. For in the ſame manner as the epilepſy, St. Vitus's dance, and other

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convulsive disorders, when brought on by worms, by sordes of the *primæ viæ*, or by a morbid state of the abdominal viscera, frequently remain after their causes have been removed, especially if the disease have been of a long standing, merely on account of the nervous system having acquired a habit of running into irregular motions at certain periods; so if diabetes have been of long duration, though the morbid stimulus, which brought on the disease, be removed, the diabetes still goes on, because the kidnies are brought into the habit of secerning sweet urine by the long continuance of the morbid stimulus. Indeed there exists a great analogy between diabetes and the convulsive disorders in many respects.

Supposing then, that it is impossible to find out the cause of the diabetes, or that, this being removed, the diabetes still remains from habit alone; the first thing we ought to do in diabetes mellitus, in all cases, is to put the patient upon a diet chiefly consisting of animal food, as it appears from the cases mentioned by Dr. Gerard and Dr. Frank*, that an absolute exclusion of vegetables is not necessary, and a certain allowance of these, being acceptable to the patients, makes them more willing to submit to the regimen prescribed, and to pay the strictest attention on their part. But to live chiefly upon animal food is requisite for the removal of the disorder, since the animal diet, though it does not cure diabetes by itself, affords a temporary relief, renders the disorder milder by suspending the for-

* Rollo, l. l. vol. ii, p. 125: and Frank, l. l. p. 208.

mation

mation of the ſaccharine matter, and puts it in the phyſician's power to uſe efficacious remedies to rouſe the vital principle to remove the morbid diſpoſition impreſſed on the kidnies, the removal of which would prove much more difficult, if the diſorder have not been previouſly mitigated by the living upon animal food. Not to mention, that animal food, being more nutritious than vegetable, a diet of the former kind is far preferable in a diſorder, wherein a conſiderable part of the blood is daily ſpent in creating a preternatural fluid.

With reſpect to the remedies by which the morbid diſpoſition to ſecern a ſweet urine, or the morbid ſtate of the kidnies, is to be removed, this depends entirely upon the conſtitution of the patient, and the ſymptoms that attend the diſeaſe. We have proved above, that the proximate cauſe of diabetes conſiſts in a certain degree of debility of the kidnies joined with a preternaturally increaſed irritability of theſe organs. In all caſes, therefore, in which the weakneſs of theſe organs ſeems to have contributed but little to the diſeaſe, and the diabetes ſeems to be chiefly owing to an increaſed irritability of the urinary organs; when the patients are in other reſpects in a pretty healthy ſtate, and do not ſhow any tokens of debility of the ſyſtem; thoſe medicines, which operate by diminiſhing the irritability of the habit in general, and of the kidnies in particular, ſuch as cicuta, belladonna, mercury, extractum hyoſciami, but more eſpecially the preparations of cantharides, kali ſulphuratum, and hepatiſed ammonia, prove highly beneficial. The operation of theſe remedies is to be promoted by the occa-

occaſional uſe of opium, both in order to prevent the ſymptoms ſometimes produced by them, and to accelerate the cure. Tepid baths are likewiſe of conſiderable utility under ſuch circumſtances; for by rendering the ſkin ſoft they promote inſenſible perſpiration, and by relaxing the body they prove a powerful ſedative.

If on the contrary the debility of the kidnies ſhould have a conſiderable ſhare in producing the diſeaſe, and the body appear to be enfeebled, the tonic and antiſpaſmodic remedies are to be employed, among which the bark, ſnake-root, alum, valerian, and the preparations of ſteel, zinc, and copper, are the chief. As a weak organ is liable to be diſturbed in it's functions even by a ſlight morbid ſtimulus, and the increaſed irritability of any part is not unfrequently owing to it's debility, it is eaſy to be underſtood, how tonics, in theſe caſes, by ſtrengthening the ſyſtem in general, and the kidnies in particular, prove powerful antiſpaſmodics, and are capable of removing the morbid diſpoſition; eſpecially when taken in conjunction with opium. Opium, however, ought always to be combined with the uſe of tonics, in order to diminiſh the irritability, and to keep off all irritation; becauſe the tonics, when adminiſtered without it, ſometimes operate as irritating remedies, and the irritability of the ſyſtem is increaſed by their uſe; the more, as upon inquiring into the caſes, in which tonics have remedied the diſorder, we ſhall find, that they have proved the moſt beneficial, when opium has been given along with them. It needs ſcarcely to be mentioned, that, when debility

of the ſyſtem takes place, cold bathing proves uſeful, and conſiderably promotes the cure of diabetes. In all caſes of diabetes, during the whole courſe of the diſeaſe attention ought to be paid to keep the *primæ viæ* clean by exhibiting rhubarb, calomel, and emetics, when neceſſary.

As it is well known, that in many caſes, both phyſical and ſurgical, iſſues or ſetons are extremely uſeful to take off the morbid irritability of the affected organs, and to diminiſh their increaſed action, by ſoliciting the humours towards another place, it is *a priori* preſumable, that iſſues over each kidney muſt conſiderably aſſiſt the other remedies, in curing diabetes. This is confirmed by two caſes recorded by Dr. Rollo, in which iſſues were applied with great benefit to the patients*. Theſe remedies are particularly ſuitable, when the diabetes ariſes from a conſolidated ulcer, metaſtaſis of a morbid matter, or repelled cutaneous eruptions, in which caſes iſſues ſhould never be omitted. If, on the contrary, diabetes, not ariſing from the above cauſes, take place in weak feeble perſons, or have weakened the ſyſtem very much by it's duration, we ought, in my opinion, to be cautious in making iſſues, becauſe, by farther weakening the ſyſtem by their diſcharge, they would be in danger of doing miſchief to the patient, inſtead of affording relief.

Phyſicians diſpute, whether bleeding ſhould be employed in diabetes. As far as may be concluded from the obſervations I have been able to collect,

* Rollo, l. l. vol. i, p. 15, and vol. ii, p. 55.

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it seems to me, that venesection proves useful only under two circumstances: either when the occasional cause of diabetes is of such a nature as to be removed or abated by bleeding; thus, for instance, Dr. Burserius has opened a vein at different times with the utmost success in a diabetes arising from an inflammation of the bladder*: or when the patient, on account of his age or temperament, is inclined to an inflammatory state of the blood; especially if the diabetes be attended with a constant pain in the region of the kidnies, or with a local pain in the thorax combined with a difficulty of breathing; in which cases venesection operates as a powerful antispasmodic, and the patients find themselves a great deal relieved after the operation. If none of these circumstances exist, and the system seem rather weakened, venesection cannot but hurt the patient. Indeed it would be against sound reasoning, farther to weaken patients, who are scarcely capable of supporting the complaint they labour under, by taking away a quantity of blood.

When the diabetes is removed, it will be prudent to persist for some time in the medicines prescribed, and the animal diet; for if the precaution be neglected, the disorder is often reproduced. Besides, as diabetes is a disease, to produce which a certain degree of debility often greatly contributes; and as it's nature is such, that it can scarcely avoid bringing on some degree of weakness by it's continuance; in all inveterate cases of diabetes, after the removal of the disorder, I would advise the having recourse

* L. I. vol. iv, p. 491.

to tonics, in order, by ſtrengthening the ſyſtem, to prevent the convaleſcent from falling into many diſorders, and even relapſing into diabetes itſelf, to which they are afterwards ſo liable from a ſlight deviation of their diet. Perhaps the reaſon, why the patients, who fell under the care of Dr. Rollo, remained afterwards weak and lean, and were obliged to be extremely careful in their diet and manner of living, in order to prevent the diabetes from being reproduced, ought partly to be attributed to this, that tonics were not uſed; at leaſt the patients cured by Dr. Frank, after the removal of the diſorder, enjoyed the ſame degree of ſtrength as previous to it.

Laſtly it is to be obſerved, that, though the fatality of this diſorder is no doubt in great meaſure to be aſcribed to it's nature being not well underſtood, and to the adminiſtration of the ſame remedies in all caſes, frequently without paying the leaſt regard either to the remote cauſes of the diſorder or to the patient's conſtitution; yet it is by no means to be expected, that diabetes will be always radically cured by proper treatment; eſpecially if the diſeaſe be of a long ſtanding, and in people of an advanced period of life. For in the ſame manner as the idiopathic or habitual epilepſy, under ſuch circumſtances, is not unfrequently found to be incurable, on account of a conſiderable alteration of the ſtructure of the brain, brought on by the long duration of the diſeaſe; ſo likewiſe diabetes, on account of the organiſm of the kidnies being conſiderably altered by the continuance of the diſorder, often does not yield to the moſt powerful remedies.

Indeed,

Indeed, though alterations of the organic ſtructure may be carried to a certain degree, without impeding the recovery of the patients by the adminiſtration of proper medicines, nevertheleſs as ſoon as a conſiderable change of the ſtructure in any organ takes place, the cure of the diſorder is to be deſpaired of as being beyond the power of phyſic. Now in ſuch caſes, where the moſt powerful remedies have been tried in vain, nothing can be done, but to palliate the diſorder, and to ſupport the ſyſtem, by living chiefly upon animal food, and by the exhibition of the bark, opium, and the preparations of cantharides.

With reſpect to the manner, in which death is brought on in this complaint: in the inſipid ſpecies, if the diſorder be allowed to go on, by it's progreſs all the functions become impaired, and the ſolids, continually affected by the morbid ſtimulus, become at length wholly vitiated; whence a languor of all the functions, torpor of the vital principle, univerſal waſting, total loſs of appetite, and a hectic fever, come on; by which the whole body is as it were worn out by ſlow degrees. In the diabetes mellitus, as the body is not only deadened by the morbid ſtimulus, but beſides is extremely reduced by the ſubtraction of a conſiderable part of the blood for the formation of ſweet urine, the hectic fever, attended with it's uſual ſymptoms, follows generally more cloſe upon the malady itſelf, ſo that this ſpecies of diabetes not unfrequently terminates fatally in leſs than five weeks. However, if either the appetite in ſome meaſure happily keep pace with the neceſſities of the ſyſtem, or the alteration

in the ſtructure of the ſecerning veſſels of the kidnies take place in a leſs conſiderable degree, the patient often holds out ſurprizingly.

Yet thoſe, who labour under diabetes, are not always carried off in the above way; for either a peripneumony or a ſore-throat ſometimes attacks the patients, towards the end of the diſeaſe; in which caſes they are deſtroyed by a ſpurious inflammation. To account for this manner of dying of diabetic patients is very difficult, perhaps it is owing to a kind of ſympathy between theſe organs and the kidnies, or to a tranſlation of the diſeaſe to the above organs.

GENUS II.

Cancerous Ulcer.

The cancerous ulcer is a ſore with hard, ragged, unequal, and very painful edges, a very unequal ſurface with conſiderable riſings in ſome parts, and deep excavations in others, attended with burning and ſhooting pains, a diſcharge of a thin dark coloured fetid ichor, and frequent hemorrhages, eſpecially in the more advanced ſtages of the diſeaſe. The veins in the neighbourhood of the ulcer are in general conſiderably enlarged.

This dreadful complaint moſtly ſucceeds to hard ſwellings of the glands, called ſcirrhoſities, which may

may be diſtinguiſhed from ſcrofulous tumours by their greater hardneſs and gibbous ſurface*.

Some writers on the ſubject, conſidering the little ſucceſs that in general attends the extirpation of cancerous tumours, have fallen into the notion, that cancer is not a local affection, but originally proceeds from a particular morbid diatheſis of the ſyſtem; and conſequently, that it's removal can never have any other effect, than to make the diſeaſe again break out in the ſame or in ſome other part of the body; the diſorder generally returning, in by far the greater proportion of all that are cut, with more violence, and making a quicker progreſs, than it commonly does in others, on whom no operation has been performed. Nay, ſome have gone ſo far as to deny, that ſcirrhus is cancer in it's occult ſtate; aſſerting, that ſcirrhus is a local affection, never paſſing into cancer, except in perſons, in whom a cancerous diatheſis exiſts. Hence they conclude, that the extirpation of ſcirrhous tumours is either unneceſſary, or injurious: for, when the cancerous diatheſis does not exiſt, the ſcirrhus will never occaſion the leaſt trouble to the patient; but if ſuch a diſpoſition of the ſyſtem be preſent, the operation will ſerve only to quicken the death of the patient.

That in caſes, in which cancerous ulcers, or ſcirrhous glands, appear in ſeveral parts of the body, the operation is not to be performed, and only hurries on the fate of the patient, is beyond all

* Soemmering, l. l. p. 105 & 106.

doubt; that likewiſe, when parts, which cannot be extirpated along with the cancer, are probably affected, the cancer is better left alone, no one will queſtion; but theſe are only particular circumſtances, brought on by the long duration of the diſeaſe, and from which conſequently no general rule can be drawn. Indeed as long as theſe gentlemen are incapable of determining *a priori* whether a ſcirrhus will terminate in a cancerous ulcer, or not, ſo long every rational practitioner will judge it his duty, to have recourſe to the extirpation of the affected part, as the only remedy to be truſted for ſaving the life of the patient, in all caſes, where the circumſtances, which forbid the operation, are not preſent; ſince ſcirrhous tumours, in an apparently healthy conſtitution, often degenerate into cancerous ulcers from an occaſional cauſe, and a general cancerous taint, if ever, at leaſt but rarely, occurs. The extirpation of all the affected parts is the only way of radically curing the diſeaſe with which we are acquainted; but the operation is to be performed in an early period of the diſorder; as experience has ſhown, that there is but very little chance of ſucceſs in the more advanced ſtages of cancer, becauſe a cancerous diatheſis is then commonly produced in conſequence of the virus being taken up into the ſyſtem by the abſorbents. Therefore in all ſuch ſcirrhoſities, as from their nature are known generally to terminate in cancer, this is to be prevented by having early recourſe to extirpation; whereas in open cancers, unleſs the ulcerated ſurface be very inconſiderable, the operation ſhould not in general be performed, from the little

ſucceſs

ſucceſs attending the removal of the cancer under ſuch circumſtances.

The cicuta belladonna, and arſenic, have been warmly recommended for curing this complaint: but it is at preſent generally agreed, that the cure of the cancer is beyond the power of medicines; therefore, when the operation is not adviſable, we can only palliate the different ſymptoms, ſo as to render the diſeaſe as tolerable to the patient as poſſible. This palliative treatment conſiſts in avoiding whatever can irritate the body, preſcribing the cicuta externally and internally, giving opiates and tonics, keeping the body open by gentle purgatives, uſing a mild nouriſhing diet, and externally applying a ſolution of alum, hydrargyrus muriatus, arſenic, or lunar cauſtic, Goulard's vegeto-mineral water, or a carrot poultice, by which means life is often ſupported for a long time.

As however none of theſe produce any permanent advantage in caſes of real cancer, the complaint becomes by degrees exaſperated, the patients grow emaciated and weakened, and a hectic fever comes on, by which they are deſtroyed. The conſumption of the body derives it's origin partly from the ſtimulus of the cancerous ulcer continually operating upon the whole ſyſtem, and partly from the cancerous diatheſis, which the patients always ſooner or later contract in this diſeaſe; for it is proved beyond all doubt, that the cancerous ichor is taken up into the ſyſtem by the lymphatics. The celebrated Soemmering has very often obſerved the abſorbent veſſels of extirpated mammæ, affected with

with a cancerous ulcer, turgid with a thin, blackiſh, livid matter, and almoſt reſembling varicous veins*.

Let it not be argued, that it is highly improbable, that an ichor ſo acrid as to excoriate and even to deſtroy the neighbouring parts, could be taken up by the lymphatic ſyſtem without deſtroying their organical compoſition; for this difficulty directly vaniſhes, when we conſider, that the deſtruction of the parts near the ulcer is ſubſequent to the excretion; that it may be greatly prevented by the repeated application of clean linen; and that therefore no concluſion can thence be drawn, that this ichor, when ſecerned, has the ſame degree of acrimony: the leſs, as no humour, however acrid it may be, proves irritating to the ſurface of the ulcer from which it is ſecerned. Beſides, it ought to be conſidered, that the cancerous matter, though very acrid, is nevertheleſs an animaliſated fluid, or a product of the animal economy; now there always exiſts a much greater affinity between the abſorbent veſſels, and the humours, which poſſeſs the character of animaliſation, though very acrid, than between thoſe veſſels, and other fluids deſtitute of this character; that in fine the cancerous matter is by no means taken up by the lymphatics, before the requiſite affinity is produced between them, and the cancerous ichor; for from this ſource is to be explained, why the cancerous *diatheſis* often appears ſo late; as the celebrated anatomiſt Dr. Cruikſhank records, that he has obſerved the lym-

* L. l. § xliv, p. 107.

phatic

phatic glands in the loins turgid with this matter two years after an extirpation of a cancerous teſticle, which ſeemed to be performed with ſucceſs*. It appears therefore, that the above objection is of no weight, and that a great difference exiſts between acrid humours produced by the animal economy, and fluids poſſeſſing a chemical acrimony, with reſpect to the human body.

CONCLUSION.

Thus I have attempted not only to explain how the lives of mankind are deſtroyed by the different morbid ſtimuli; but alſo to ſhow how their manner of deſtroying is conſiſtent with the nature of every diſeaſe, and may often be determined beforehand from it, and what are the beſt means of preventing the morbid ſtimuli from proving fatal. It is true, indeed, that different effects ariſe from the ſame diſeaſe in different patients; but, on the one hand, theſe varieties, with regard to the manner of dying, and the means of preſerving life by medical treatment, are moſtly of inferiour moment; and on the other, as the conſtitution of the body is differently modified in every perſon, the ſame malady does not produce entirely the ſame ſymptoms in any two patients; ſo that it is impoſſible to take particular notice of all theſe varieties.

* L. l. p. 113.

Thus

Thus having gone through the vaſt extent of noxious ſtimuli, and having laid down the manner in which each of them brings on death, together with the beſt means of ſucceſsfully reſiſting their operation on the ſyſtem; I ſhall now inquire, whether any general rules, as to the hiſtory of corporal death, can be drawn from what I have proved in the courſe of this treatiſe. We have ſeen above, that all the morbid powers, though very different, agree however in this, that they always affect our body as a ſtimulus; we have farther proved, that ſpecific changes are produced in the human body, when ſtimulated in a determinate way, and that on this the whole difference of diſeaſes depends.

As thus the morbid cauſes operate on our body with their peculiar ſtimuli; as the vital powers react differently, according to the different ſtimulus applied; as the nature of every diſeaſe is modified both by the noxious ſtimulus, and the reaction of the ſyſtem; as, in fine, the different manner of dying, and the medical treatment requiſite to preſerve life, depend upon the different nature of the diſeaſe; it was requiſite particularly to inquire into each of them in this treatiſe. Nature, however, which always follows conſtant laws, purſues a certain and determinate order, even in the different manners of deſtroying life. Hence all the morbid ſtimuli, however widely their circuit extends, however differently they operate, and however ſecretly they often ſteal on to deſtroy the organiſm of the body, put an end to life only in two general ways, either by extinguiſhing the vital principle, or by impeding or deſtroying the vital functions.

functions. Nay all the differences of death, on account of the analogy which exists between them, may be reduced to a few classes; so that I have ranked the morbid stimuli operating by extinguishing the vital principle in seven, and those which prove mortal either by impeding or destroying the function of one or two vital organs in five. The differences of dying belonging to every class may likewise be easily accounted for; because they do not exceed a certain and determinate number, as will appear on taking a general view of each of them.

In the first class, where death is the consequence of the mechanism of the body, man dies by the too great rigidity of the solids, and by their insensibility to stimuli. Such a state of the system, with the manner of dying dependant on it, is brought on the solids merely by life itself, without the least morbid cause, and is therefore distinguished from all the other classes, which destroy life by the operation of a morbid stimulus.

In the second class, in which death follows the too violent passions of the mind, the patients are destroyed either by an apoplexy, syncope, or suffocation. All these differences of dying therefore agree in this, that an accumulation of the blood takes place in some vital organ, which, overwhelmed by the too great quantity of blood, ceases to act. Though thus various organs are affected, according to the various passions, and the different constitutions of the persons attacked, nevertheless the patients are always carried off in this class by the impeded function

function of ſome vital organ, ariſing from the congeſtion of the blood.

In the third claſs, where death is occaſioned either by the exceſs, or want of *caloric*; if the patients be carried off by too great cold, the blood is always driven to the internal organs, and life is extinguiſhed in the ſame manner as in the foregoing claſs. The ſame ſeems to happen, where the patients die from ſuperabundant heat. It is indeed true, that hitherto nothing certain is proved as to the immediate cauſe of death in this caſe; yet if we conſider the phenomena accompanying too great heat, it will appear, that, if not always, at leaſt in moſt caſes, life is deſtroyed either by apoplexy or ſuffocation.

In the fourth claſs, where death is produced by too great electricity, the life of all the organs is aboliſhed, as it were, at a ſingle ſhock, by the violence of the ſtimulus, ſo that the patients are immediately found inſenſible even to the moſt powerful ſtimuli. Thus they die by a ſudden extinction of the vital principle.

In the fifth claſs, where death happens from ſome *gas* noxious to the animal economy, though the ſymptoms greatly differ, according to the various ſpecies of gas, the patients always die from ſuffocation.

In the ſixth claſs, where death is produced by poiſons, though at the firſt view nature does not appear to purſue a certain order as to the manner

of dying, and though, beſides, the true manner in which many poiſons kill has hitherto not been properly inveſtigated, nevertheleſs, upon a more accurate conſideration, it ſeems, that the different ways of dying by poiſons are alſo not numerous; but that nature, even in this claſs, follows conſtant laws, and, indeed, by all that I have above ſaid of the poiſons, the patients in this claſs ſeem to die only in four ways; for all poiſons operate either by aboliſhing the vital principle by the violence of their ſtimulus; by deſtroying the action of either the brain, the heart, or the lungs; by producing gangrene of the *primæ viæ*; or, laſtly, by ſecretly and inſenſibly deſtroying life. In the laſt caſe the organs becoming by degrees altered in their ſtructure, and inſenſible to their uſual ſtimuli, a tabes enſues, accompanied with a hectic fever, which terminates in death.

In the ſeventh claſs, where death is brought on by univerſal diſeaſes, diſorders are enumerated, which are quite oppoſite to each other; and hence it muſt follow, that many differences of dying alſo appear in this claſs. Yet the patients are only carried off in ſix different manners; for they die by the extinction of the vital principle by the too great violence of the morbid ſtimulus; by the impeded function of either the brain, the heart, or the lungs; by a local inflammation; by the gangrene of ſome vital organ; by an alteration of the organical ſtructure in the alimentary canal, by which a colliquative flux of the belly is produced, which is to be ſtopped by no medicines; or by the depraved action of the organs ſerving to the ſecretion of

ſweat,

ſweat, in which caſe the whole body is, as it were, conſumed by perſpiration.

In *the eighth claſs*, where death ſucceeds to inflammation, nature is not leſs obſervant of conſtant laws; and the inflammation of any *viſcus* whatever leads to death only in four ways; by violent convulſions; by the function of either the brain, the heart, or the lungs being deſtroyed; by the violence of the inflammation, by which the vital principle is often quickly aboliſhed, in conſequence of the ſuppreſſion of a vital function; or by the gangrene of ſome organ ſucceeding to it's inflammation.

In *the ninth claſs*, where death ariſes from different fluxes, all the differences of dying may be reduced to the five following: ſpaſm, by which nature in vain endeavours to reſtore the diſturbed equilibrium; the loſs of too great a quantity of blood, by which the patients fall into a fatal ſyncope; the impeded function of ſome vital organ; ſphacelus of the alimentary canal; and a peculiar degeneracy of the inteſtines, by which the patients are continually impelled to go to ſtool with extreme proſtration of ſtrength. If the laſt be attended with teneſmus, it is called a chronic dyſentery; if not, it is named a colliquative diarrhœa.

In *the tenth claſs*, where death is occaſioned by cachexies, though I have brought into it many diſeaſes, nevertheleſs the differences of dying do not exceed ten: for death is produced by the conſumption of ſome organ requiſite to life, or from the deſtruction of the tone of the whole body by the

the violence of the ſtimulus, which is the manner in which phthiſis deſtroys; by the violence of the noxious ſtimulus, which weakens the ſolids daily more and more without the conſumption of any vital organ, as is the caſe in the lues venerea, ſcrofula, rachitis, &c.; by ſuffocation, by which thoſe who labour under the dropſy of the thorax, are generally carried off; by apoplexy, in which a general dropſy not unfrequently terminates; by ſyncope, which manner of dying is particularly common to the ſcorbutic, on account of the torpor of their vital principle; by hemorrhage, by which the flame of life, already deadened by the diſeaſe, is totally extinguiſhed; by a colliquative flux, which puts an end to life, by depriving the body of it's remaining energy; by the ſphacelus of ſome organ; by the violence of the morbid ſtimulus, by which life is quickly aboliſhed, a manner of dying, though unfrequent in the diſeaſes of this claſs, ſometimes happening in the ſphacelus; and laſtly, in mortification the abſorbed ichorous matter, when not ſubdued by the vital powers, ſometimes produces a malignant fever, which carries off the patient in different ways, according to the various circumſtances.

In *the eleventh claſs*, in which death is occaſioned by diſorders of the nervous ſyſtem, the different ways of dying are not ſo numerous; for in the ſame manner as all the nervous diſeaſes may be reduced either to ſpaſm, or atony, ſo likewiſe the chief ways of dying in this claſs are only two, and life is generally aboliſhed either by violent ſpaſms, or by an apoplectic fit.

In *the twelfth claſs*, in which death ſucceeds to the diſeaſes of the ſecretory organs, three different ways of dying occur; namely, either the noxious ſtimulus, ſtealing on to deſtroy life, by ſlow degrees oppreſſes it, as is the caſe in polyſarcia; the ſolids become enervated, and altered in their ſtructure, either by the continually ſtimulating noxious power alone, or both by this, and the exhauſtion of the blood for a ſecretion of a peculiar kind, in each of which caſes they are deſtroyed by a hectic fever accompanied with it's uſual ſymptoms; or the vital principle is aboliſhed by the impeded or deſtroyed function of the brain, heart, or lungs.

Thus far I propoſed to extend this treatiſe on the different ways, in which life is deſtroyed in mortal diſeaſes, and the beſt means of preventing them by medical treatment from proving fatal. It is true indeed, that there are many matters in it, of which I have only ſpoken in a curſory way, though they deſerve a more ample conſideration; but the great number of things I had to notice, and the compaſs of this treatiſe, did not permit me to inquire more fully into ſubjects, which would have taken up ſome volumes, if treated of as they ought. Let it therefore ſuffice to have proved, that, though

" *Mille modis lethi miſeros ſors una fatiget*,"

nevertheleſs the differences of dying are not innumerable, but, on the contrary, nature conſtantly follows certain and invariable laws even in the different

ferent manners of deſtroying life, ſo that all the differences of dying may not only be reduced to a few claſſes, but beſides it may be determined in how many ways life can be extinguiſhed in every claſs; and to have pointed out what are the beſt means of preventing death by medical treatment.

I now flatter myſelf with the idea, that however imperfect this performance may be, yet it may excite others to cultivate this important ſubject, and thus I may have contributed in ſome meaſure to the improvement of the healing art, and to the benefit of mankind.

THE END.

THE END.